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AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

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Automatic Spoolers
High Speed Warpers

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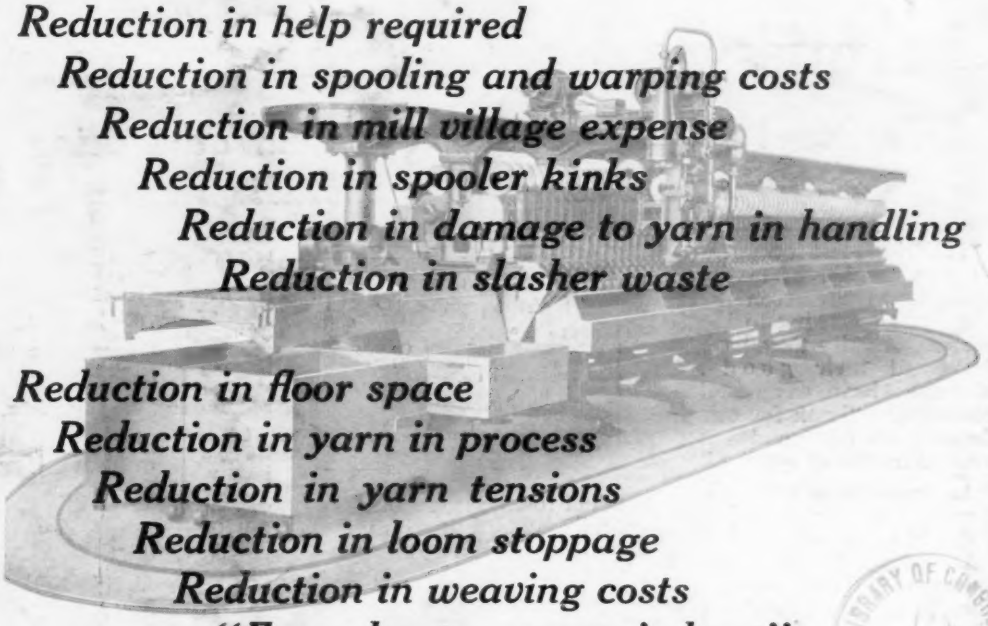
Reduction in spooling and warping costs
Reduction in mill village expense
Reduction in spooler kinks
Reduction in damage to yarn in handling
Reduction in slasher waste



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Reduction in yarn in process
Reduction in yarn tensions
Reduction in loom stoppage
Reduction in weaving costs
"Every knot a weaver's knot"

BARBER-COLMAN COMPANY

GENERAL OFFICES AND PLANT
ROCKFORD, ILL., U. S. A.

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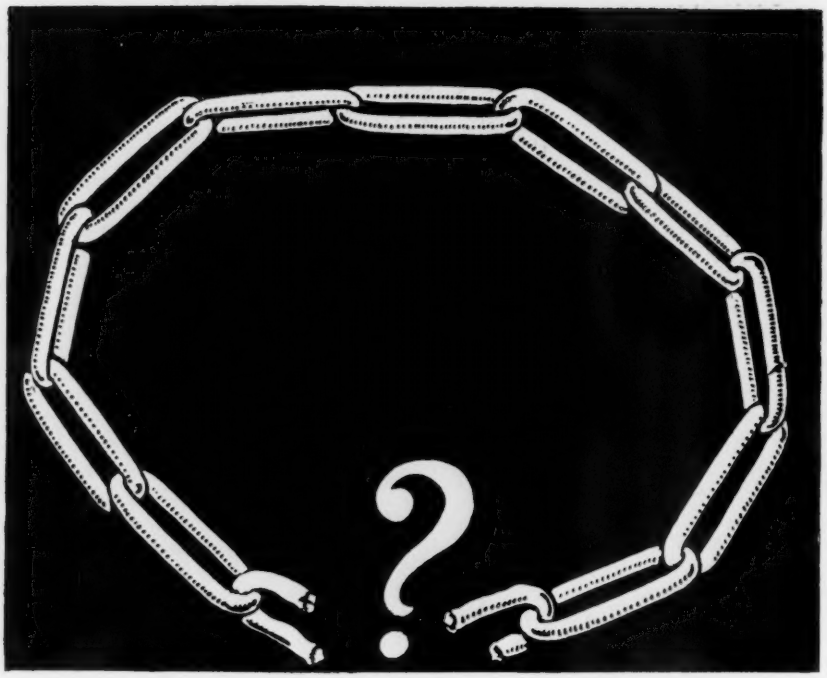

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COTTON

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The above photograph gives some idea of the extraordinary beauty and originality of the new Ipswich hosiery. But it can give no idea of the striking and permanent luster which is imparted to this hosiery by Celanese brand yarn.

The newest Ipswich socks feature Celanese brand yarn

THE Ipswich Mills have just announced an important addition to their line: men's hosiery made of Celanese brand yarn.

Lustrous, brilliant, these new Ipswich fancies have the fine, even texture of socks of high-count thread silk. Dyed with the special SRA dyes, their rich colors are all fast to soap, sun, salt-water, and perspiration.

An electric quality, peculiar to Celanese brand yarn, makes this hosiery cling, skin-smooth, to the ankle.

Six styles of the new socks will be advertised nationally for the coming season. Strikingly handsome, beautifully made, they can be depended upon to sell and to stay sold.

Our concise brochure, *What you should know about Celanese*, will be sent to you upon request

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With the Publishers—

Hitting the Sheep Counting Industry

Among the unique machines of the kind that interest the daily press are two recent inventions which are designed to do what COTTON tries, in a way, to do for the textile field.

One, which is credited to an English inventor, is a device for inducing sleep. It does away with the conventional method of counting sheep as they jump over a fence. Instead it flashes rays of light of twelve different colors in a sequence that enables the victim of sleeplessness to be soothed into sound slumber.

The same effect is sought by COTTON when it tries to sufficiently help the textile executive with his problems, so that he will have no cause for lying awake nights. No expensive machine will be needed if a mill superintendent can adapt to his own plant the plans that are keeping other mills running smoothly at a good profit. A clear-reading article on the methods of a successful mill turns upon a harassed superintendent as many soothing rays as any special machine ever invented.

The second machine, worked out by specialists at Princeton, is called a "correlation machine." As one writer describes it, "In plain English it does a man's thinking for him." The device is simpler in number of parts than an ordinary typewriter. It receives through a punch board, like that on a calculating machine, groups of facts which it, on the turn of a handle correlates.

An example is given: "A man smokes a certain amount of tobacco per day, he averages a certain amount of sickness a year and he has a certain blood pressure. How do these facts affect the probability of his life duration?

"The correlation machine will tell. And it makes its revelations in about fifteen minutes time, whereas other methods of calculation would require hours of human concentration and a probability of brain fag."

Here is a field where COTTON is outdistanced, but in the textile industry it has always tried to put two and two together and see how the answer was going to affect the life duration of the industry.

Inventions like these surprise us but COTTON believes that its editorial and advertising pages from time to time make equally interesting revelations to textile men. As Odds Bodkins said in Advertising and Selling Fortnightly, "To me it is a mighty comforting thought that always someone is busy working out the things I am wanting and needing.

"Were I a manufacturer or the head of some great service organization, constantly wanting and needing so many things—new ideas, new processes and materials, new devices and machines—I should haunt the pages of the journals of my trade or industry always searching for new things, whether in the text or advertising pages, some of those things I want or need.

"Even the most impossible things are being developed or discovered and presently they will be announced in these journals."

The idea of opening and cleaning cotton and then rebaling it before taking it to the mill for working would seem to entail much useless labor, but an article in December COTTON shows that one colored goods mill saves enough on dyestuffs to more than pay the cleaning cost. And cleaning is but one of the advantages.

AMONG COTTON'S READERS

William J. Vereen

Vice-President and Treasurer, Moultrie Cotton Mills, Moultrie, Georgia.

President, Poulan Cotton Mills, Poulan, Georgia.

President, American Cotton Manufacturers Association

"COTTON has been of untold value to the men in active charge of the textile industry. It keeps me up to the minute in machinery and methods."

January, Nineteen-Twenty-Six

The Evolving Problem of Leisure.

A well-known economist misses no opportunity for taking a whack at what he claims is excessive use of golf links by many folk who in that way get open air exercise and diversion as a counter to sedentary work. During the last dozen years golf truly has taken on the aspects of a big national industry. That the game is healthful for most of those who play it is without question. But what the economist claims, with not a few other persons agreeing, is that golf can become an insidious and dangerous vice. He illustrates his pleadings with recurring news items about middle-aged and elderly men dropping dead with golf clubs in their hands.

Other critics of trends of the time take as telling whacks at the growing custom, among business men and executives, to give huge slices of time to attending conventions and gatherings of various sort. It is not difficult for any business man to put in half of his time enjoying that qualified form of diversion—and some do it. The number of organizations that hold regular conventions and are divided up into groups and committees which meet between-times is way up in the thousands.

Not a few of them are welfare or semi-philanthropic organizations, of which enterprises there are all told a stupendous number. They are vitalized usually by persons who have little else to do—and in that way employ energy not consumed in the attending to their own business. Many of these enterprises are worse than nuisances; they often are specifically dangerous.

Those who criticize and ridicule such peculiar phenomena of this period have not brought to light for study what probably is the puzzling inner cause.

It is the great surplus of leisure, spare-time, that suddenly has fallen into the hands of the American people. Scarcely any of us will admit that we have more time than we know what to do with, but most of us are so inflicted. The appearance of busyness is dear to most people but with the majority it is now an affectation.

A lot of folk still are too heavily laden with work, on account both of necessity and choice. Anyone still can find plenty of work to do, somewhere and somehow. But not many folk are prone to do more of labor than they have to for one reason or another. And there has been a great let up in the "have to" incentive.

With the upper class of workers, such as proprietors and managers, the let up has been proceeding somewhat rapidly for the last quarter of a century. It owes largely to a long period of rather continuous prosperity, to the growth in the science of organization, and general development.

Lately the let up has been most remarkable among the employee class of workers. This is shown statistically in the shortening of the average work day, which, in fact, has been reduced as much during the last dozen years as during all of the last century. In recent years the economic position of the day laborer has improved relatively most of all.

There has been tremendous lessening, virtually all along the line, of the economic pressure making for long hours and unbroken days of steady labor. It is stated by a statistician that the people in the average American city of 100,000 now have in a single year enough leisure time to build a Panama Canal.

This rather general possession of surplus time is a new phenomenon and presents many new and puzzzling social problems. For only some of those born in the "leisure classes" of old have been trained for the use of leisure beneficially to themselves or others. Most training has to do with work. Formal education, for the last generation or more, has been predominately occupational. It has aimed at preparing folk to do something; rarely has it aimed at preparing them to do nothing; that is, towards equipping them for getting the best to be obtained from leisure.

Hence those who find spare time on their hands usually are unprepared for it and have to resort to make-shifts for employing it. Many of these are bad, particularly when carried to excess, for those using them and others. The golf fiend, the inveterate "joiner," the meddling welfarist is among the products of this condition—not to mention the expansion of the "movies" and the flivver. A good many social insurgencies grow from it. No one can begrudge the time which thousands who once had little for the purpose now use for indulging the painful process of thinking. But when their unpreparedness for this praiseworthy enterprise is taken into account, fear as well as pity may be aroused by the prospective results.

This relatively new national asset, "leisure," can and should be turned to profitable account. It is a factor which should be considered more than it is in forming schemes of formal education. The nation's leisure certainly should not be left to the exploiting whims of the professional and meddling welfarist and, by all means, it represents one phase of life over which the regulatory branches of govern-

ment should be forced to keep hands off. Discerning politicians already are seeing big opportunities in it for themselves.

There are practical phases of it which employers should study; and in fact many have studied these by the process of extended experiment.

But no one scarcely as yet has fully comprehended the problem, as shown by the fact that no one has succeeded in even describing it.

The phenomenon is provocative of some interesting speculations, which, after all, may be only pure fancies. If the processes of production continue to be speeded up as during the last quarter of a century it is not wholly ridiculous to imagine the coming of a time when work will be sought generally for itself alone. It may not be without psychological significance that the unemployed invariably complain of being out of work, rather than, specifically, in want of those creature needs which with most of us are met through the earnings of our labor. For most human beings work is an habitual, if it isn't a biological, necessity. We think we hate it but when we haven't it we miss it as a diversion probably more than as a means of livelihood.

Already there is great need for providing something to do in lieu of work for millions of persons who now have a large volume of time which they do not know how to use satisfactorily.

An Under-Cover Form of Socialism.

Recently there was held a conference in which representatives of many branches of private industry participated, the purpose being to check a tendency that is productive of much business unfairness and political danger. The tendency is that of public officials to use the instruments of government for economic, aside from political, purpose. It is a form of socialistic boring from within under the guise of economy and efficiency. It is typified by the practice of using day labor method in doing much public work, notably construction.

The public payrolls of the country show that an enormous number of persons, around three to four millions, enjoy government employment in this country. An additional million or two are not on these rolls. They are employed for particular jobs attended to directly by officials instead of being let out on contract to those branches of industry operating in the particular fields. Some students of this growing practice say that so-called day labor employment is being used by politicians as a substitute for forms of political patronage no longer available on the scale that it was before the extension of the civil service selective principle and the abolition of the saloon.

The practice is defended on the ground that it results in saving public funds. This is disputed. Rarely does an undertaking thus carried out square at the finish with preliminary estimates. Moreover, nearly all the accounting having to do with such activities is faulty. Army engineers, for example, omit many factors of real cost when making up final reports on construction jobs.

The American public has little confidence in government ownership and operation of business enterprises. Municipalities now own and operate such things as light, power and transportation plants in only about the same degree as they did thirty years ago when there arose an energetic demand for such adventuring in modified socialism.

But economic operations of all sorts by government has grown, usually under cover and ostensibly outside of the principle of government ownership. Thus many branches of industry often have to meet the unfairest kind of competition—that which they themselves are forced to support with taxes.

The movement initiated recently probably will bring about a new survey of this problem and no doubt will disclose much that is reprehensible.

Governmental activities, being not dependent on profits, tend, like bad money when brought in contact with good money, to drive all competition out of the fields affected. In some kind, as with indemnity insurance as handled in several States, outright monopolies have been decreed by law.

Such practices lead inevitably towards state socialism and to the extinction of individual initiative.

A "Foreword" That's Worth Repeating.

Annual reports of officials frequently are as distinguished for what they don't as for what they do contain. Many a bit of detail which those who write these reports wish to conceal or obscure is overshadowed by ponderous compilations and bromidic generalities that mean nothing.

One finds, however, at the very beginning of one of the Federal departmental annual reports a few platitudinous statements that are worth repeating. They are put forth, as a "Foreword" to his annual accounting, by Secretary Hubert Work, of the Department of the Interior.

"There is no mentor for official acts except public opinion, no safeguard against errors of judgment except detail knowledge, and no rewards except conscience. . . .

"The temptation is great to purchase official popularity through complaisance in the expenditure of public funds. The Government administrator who promises, trusting to time or circumstances to relieve him of the obligation, gains immediate applause but he speculates with his integrity of purpose."

It wouldn't be far from the truth to say that around one-third of all the funds collected and spent by the Federal —and possibly by other units of government, too—represents in some way little more than the purchasing or bidding for official popularity or security.

Those in office are not the only guilty ones. Outsiders frequently are even worse offenders. Notable among these are leaders in organizations or the owners of publications who put over "movements" looking to vast expenditures of public funds on prospective members or subscribers, or indirectly for their benefit. There are many instances of officials having thus been clubbed into allowing the public exchequer to be used for essentially private purpose.

As noted elsewhere, the thirtieth annual convention of the American Cotton Manufacturers Association will be held in Atlanta, Ga., Tuesday and Wednesday, May 18-19. Convention headquarters will be at the Atlanta Biltmore Hotel, where all available rooms have already been reserved in the name of the Association, according to Secretary Adams, who urges that those who plan to attend write at once direct to the hotel and thus obtain the desired accommodations. This is the first meeting of the Association to be held in Atlanta since 1916.

Warp Sizing

BY PAUL SEYDEL.

The Slasher Room.

Anyone who has seen many representative European cotton mills and a considerable number of American mills will invariably arrive at the conclusion that although a few European mills may be up-to-date, that the average American mill is better equipped and more efficient mechanically than the average European mill, and especially can this be said of southern mills, and yet there is room for improvement here, as well as abroad.

The most crying need in the slasher room is a dependable method of regulating the moisture on the warp as it comes off the slasher. The writer has tested for moisture hundreds of samples of warp taken from the slasher and immediately sealed in a glass fruit jar and the results of his tests show moisture anywhere from less than 2 per cent up to 14 per cent.

It is a well known fact that a warp dried to a state where there is a deficiency in moisture has been baked so that the size film has lost its elasticity with the result that in weaving not only its weakness will cause excessive breakage, but cause a good deal of shedding. Excessive baking will usually cause scales like small dandruff to drop on the floor of the weave room as well as considerable shedding of small fibers. A practice that causes trouble is the fact that often for some reason the slasher man stops his machine causing from 20 to 40 yards of warp to become dried to an extent where it is considerably weakened. This should be avoided as much as possible.

A warp not sufficiently protected with efficient preservative will on the other hand mildew in time if it contains as much as 14 per cent of moisture, as several samples submitted to me have proved to contain.

One system that has helped is a temperature control of the slasher drum. When it has been determined that a certain temperature produces a warp with a satisfactory amount of moisture, the temperature of the drum can then be controlled and it is often found that this temperature can be maintained with less than one pound of steam in the slasher drum. Of course the pressure needed depends largely on the speed, the size of the drum and the quality of the steam.

An experienced slasher man who is situated so that he can occasionally check up his estimates by laboratory tests can arrive at a relatively accurate estimate of the amount of moisture in the warp. For instance he may find that a warp containing less than 4 per cent of moisture feels decidedly dry, warm and comparatively harsh. The same warp on the same slasher with from 5 to 9 per cent feels noticeably cooler and softer and above 10 per cent feels decidedly damp and cool. The average slasher man, relying on his experience, has only his sense of touch to guide him and if he has had a few mildewed warps he will, as a rule, be inclined to remain on the safe side with the result that instead of averaging at least 8 per cent of moisture on the warp, as it should be, the samples I have analyzed seldom showed more than 4 per cent, which is decidedly too little moisture for ideal weaving conditions. Of course, most mills have humidifiers, and although I do not wish to be understood to belittle their value, nevertheless it is a fact that a starch once baked so as to destroy its elasticity cannot regain it to any considerable extent through new moisture being added to the overbaked size.

The writer has no doubt that a hygrometer could be devised, composed of a chamber through which the warp would pass just before reaching the loom beam. It would have a control which could be set for any percentage of moisture, whenever it is exceeded, a suitable mechanism would open up the steam valve controlling the temperature of the slasher drum, or the valve would be closed if the percentage of moisture would drop. Such an instrument would permit us to leave an absolutely even percentage of moisture on the warp and it is easy to appreciate the advantage of such a desirable instrument. It is up to some control expert to devise this and it would be the greatest possible advance for the slasher room. No doubt this will be produced before long and mills of the future will set their hygrometer for from 8 per cent to 10 per cent of moisture and greatly improve their weaving. The proper preservative will make mildew growth impossible with this percentage of moisture. I might say here that the proper preservative must be a permanent, non-volatile substance which will not evaporate on the slasher drum as every strictly organic preservative will do.

A number of mills cover their size kettles as well as their circulating system, and some even the ends of their slasher drums, as well as all steam pipes with asbestos covering. This is excellent practice. It greatly helps to maintain an even size mixture and to save steam. It is easy to understand that if a kettle radiates heat, in order to keep the contents at the boiling point, as it should be, a considerable amount of steam condenses in the kettle which produces, of course, a very undesirable variation in the concentration of the size.

Paul Seydel, the author of this series of articles on "Warp Sizing," was graduated with honors in 1904 from the "Doctorat en Sciences Chimiques" at the University of Brussels, a school that has turned out a goodly number of great chemists. Possibly the Brussels University graduate best known in this country is Ernest Solvay, who is the father of the modern soda industry. Some greater scientists and chemists may have graduated from Brussels and other universities, but none more successful as a practical inventor, industrial leader and philanthropist. The number of great chemists graduated from Brussels is sufficient proof of the scientific and practical values of the teaching methods adopted there.

When Mr. Seydel came to this country he began to specialize in textile chemistry and gradually built up a research staff which included a number of chemists, graduates of the best schools. For many years his occupation consisted of research, manufacture, and actual practice, including products of every textile nature. This work frequently took him to the mills for days at a time in order for him to see his theories worked out from every possible angle.

As Mr. Seydel can read readily in six languages, he has read most of the important literature on textile chemistry in the original vernacular. Thus his scientific statements rest on the foundation of a highly specialized theoretical and practical knowledge acquired during the last twenty-five years.

The absence of such protection is mostly felt when it is attempted to keep size overnight. Some mills have found that it is not worth keeping and it certainly is not if a kettle or a part of the kettle is allowed to cool to such an extent that the starch has formed a jelly and before it is brought to a satisfactory temperature the next day, a great deal of condensed steam is allowed in the size kettle, thus considerably reducing the strength of the size.

It is a well known fact that if starch has been allowed to cool sufficiently to form a jelly and it is then brought back to a boil this size will not have by far the colloidal properties of fresh size and the difference in results obtained will not justify the use of such reheated sizes. If it is desired to keep size overnight it should by all means be kept warm, and this can be done by having a storage kettle amply protected by a jacket of asbestos. It is so easy to do and so cheap that it is remarkable that so many mills do not have their size kettle so jacketed.

For a kettle 36 x 36 place a dozen strips of wood ½ x 1 x 36 on the kettle. Draw a chicken wire around the kettle and fasten with steel wire, then a couple of bags of asbestos cement mixed with sufficient water are plastered on to the wire which serves as a reinforcement. After the jacket dries it is a good practice to paint it with one or two coats of oil paint to protect the asbestos against the disintegrating effect of water and it is still better to tie a cheap cotton fabric over the asbestos and paint this cloth. This protection costs but a very few dollars. When properly done it is quite lasting and is one of the best investments that can be made in a sizing installation.

Another very small expenditure that is an excellent investment is to build a small box with a copper screen bottom through which the size is filtered just before it gets into the size box. This eliminates the possibility of allowing any lumps or bits of wood, bagging, etc., from the starch into the size box, the advantage of which can be readily appreciated. These little screens can be cleaned very readily once a day.

The size kettles should be small and provided with a stirring device. It is important that the bottom paddle be as near to the bottom as possible, and as near the size of the diameter of the kettle as practical, so as to obviate the possibility of starch or size remaining undisturbed in the bottom and corners of the kettle and to insure a perfect mixture.

It is much better to make six or eight batches of size per day in small kettles than to make one or two in a large one. This of course works for uniform size and results.

Another practice very useful to insure uniformity of results is the care of weighing starch and compounds, and measuring water accurately.

In some mills the practice exists to put a certain number of pails of starch in a kettle. The danger is very evident that the slasher man might be interrupted and may lose count with resulting mistakes. These are obviated in some mills by moving on a horizontal wire a number of steel washers corresponding to the number of pails to be used one at a time as each pail is dumped in the kettle.

I have seen in some mills roving cans being used and cut to size so that one or two cans full constituted the amount of starch used in a batch and a galvanized iron container of a certain size full, constituted the amount of sizing compound used per batch. This evidently is an excellent practice well worth adopting. The practice generally adopted today for preparing a batch of sizing compound is to fill a kettle with cold water up to a certain mark somewhere between one-half and two-thirds the volume of a finished batch, the starch is then mixed with the cold water for a few minutes. The compound is then added and finally the steam admitted gradually so that the boiling point is reached anywhere between twenty and thirty minutes. It is generally agreed that the slower this point is reached within reasonable limits the better it is. After the boiling point is reached thin boiling starch is boiled at least thirty minutes, thick boiling starch is boiled at least one hour. Longer boiling within reasonable limits is always beneficial. By the time this boiling is over the volume desired is nearly correct and an inch or two of water will bring the size up to the correct amount.

In subsequent articles I propose to discuss ingredients going into the making of good sizing. Although some mills have endeavored to make their own compound at one time or another, the large majority are buying compounds ready made or specially made for them as they have found that in the end, from the standpoint of economy and efficiency, they are not able to duplicate the best and most reliable brands ready for use that can be found on the market and which reliable, scientific manufacturers can make cheaper and better than can the mills themselves.

INTANGIBLES IN MANUFACTURING

A Series by

Frederick H. McDonald.

Service—Made in the Product.

"Satisfaction, or your money back!"

Guarantees of workmanship, materials and serviceability are the final clinchers put into sales efforts these days to decrease the resistance to absorption that mass production is constantly facing anew.

Whether it be just an added inducement, whether "the truth in advertising" trend has forced it upon the producer, or whether it be but a measurable expression of honesty of intent and practice—it is here to stay.

And the lead in any one field of production cannot be approached on any other ground.

Which means that a manufacturer, if he would compete at all for future growth, must consider this necessity as a phase of production requirement, and lay out his plant and processes accordingly.

Soundness and accuracy of workmanship—machine ranges within narrow limits; material that will stand the gaff of usage and discriminating taste; a type of labor skilled—and with the desire to do; and finally, adequate and competent tests and inspection before release for market—

Thus, and thus only, can service be guaranteed—if one would have it a fact of performance, rather than a smooth, mouth-filling lubricant of sales-pressure argument—

With a steady stream of returning rejects, complaints, or refusals to repeat.

And a genuine saturation—resultant of unsuccessful deception!

The South is Still a Young Empire

Extract from an Article in The Magazine of Wall Street, New York, December 5th, 1925

Paraphrase the old line into "Southward the course of Empire wends its way," and you have the truth about the United States today. In *The Magazine of Wall Street,* the economic growth of the South has been repeatedly commented on, most notably in our June 6th number, page 204. But special consideration is merited by the rate of growth of the South as compared, not with the United States as a whole, but with the rest of the nation.

One general prejudice must be corrected. The human race thrives naturally in warmer climates. Two-thirds of mankind live in the warmer countries. If northern Europe and northern United States have had dense populations, it has been due primarily to the earlier exploitation of coal, iron and water-power. Once the warmer climates exploit these, however (and they have the greater supply) the course of Empire will again wend its way to softer climes. Contrary to general impression these climates do not make for inertia; thus, industry, art, culture originated in India, Egypt, Mesopotamia. Modern industry will likewise be enthroned in the warmer climates. Hence, the undeniable potentialities for our own South.

Industrial Development.

There are a few outstanding developments in Southern industry known to everyone. That the balance of power in textile mills, especially in cotton spinning has shifted South is a commonplace. From 1880 to 1923, the North doubled its spindleage of 10 millions, whereas the South increased its half million spindles thirty-two times.

In sulphur production, whereas thirty years ago Sicily dominated the world, today the South controls this great industry; the very bony structure of our chemical processes. A production of 2 million tons today compares with 3,000 in 1900.

In iron, the fame of Alabama, especially the Birmingham area, is worldwide. Southern production is a ninth of the nation's despite the fact that the astounding combination of Lake Superior ore and Connelsville coke gave the North a great impetus, never before equalled. Still the South has grown faster. Whereas, forty years ago the South produced cruder pig-iron, today it manufactures costly finished goods.

As for lumber, the center of gravity has shifted South with a vengeance. Timber grows to its full lumber-cut size in fifteen or twenty years in the South. In cold climates it takes twice or four times as long. Hence a double cut in the South is more conservative than a half-cut in Canada. One-fourth the acreage of a Canadian timber company will supply the Southern grower with as much lumber. In 1870 the South produced 2 billion board feet a year against 11 billions in the North. Today it produces 17 billions out of 31 billions, or the greater part. The North practically produces no more than it did a half-century ago. When one thinks of the supremacy in naval stores (rosin, turpentine) that goes with this timber leadership, its importance becomes obvious.

Fuel and Power.

In basic fuels and power, the South is similarly forging ahead. There are four great modern sources of industrial power. They are coal, petroleum, natural gas and hydro-electric enterprise. The coal production of the United States in 1870 was 33 million tons. The South contributed 3 millions. Today, the nation produces 600 millions and the South contributes over 160 millions. From a tenth to a fourth of the production is the record of growth.

In petroleum, the South produces about 35 per cent of the world production. In 1900, the slight Texan development, etc., was only a harbinger of this source of world-power. As for its by-product, natural gas, the Louisiana field alone, is a source of industrial power that may well make western Louisiana one of the world's most highly industrialized areas. It should surpass Eastern Ohio and West Virginia's development on the same basis. Already, the amazing growth of the Monroe field clearly reveals this development.

But it is in electrical power, more especially, that the South is taking the strides of a young giant. Whereas, in this greatest decade of the growth of electrical power, the North has advanced about 150 per cent, the growth of the South has exceeded about 215 per cent. Installed capacity is about 1.7 million h.p., with 4 million h.p. available as primary power (that is, available at least 90 per cent of the time) and as much as 7.5 million h.p. available at least 50 per cent of the time (secondary power). Six great systems dominate the picture and this large concentration is of the greatest use to the South. It is rather entertaining to reflect that the South, the great home of the Jeffersonian tradition against monopoly, should be that section of the Union that most enjoys the benefits of concentrated economic organization in a basic power field. The southern super-power development is quite the best known, and will be augmented by the Muscle Shoals development of 600,000 h.p.

To turn to the uses of this wealth of fundamental fuels and power, first, of course, come the rails. Their mileage has increased since 1900 by about 47 per cent whereas the rest of the nation increased its mileage in this period by only 21 per cent. Southern mileage rose from 61,000 to 90,000. Total railroad investment exceeds 5.5 billions, or is exactly in proportion to what it should be *per capita.* That is, in the basic position of railroads, the South already has caught up with the rest of the Union. Whoever will take the trouble to ask what rail shares have made spectacular advances would have to mention Southern, Atlantic Coast, Seaboard, M-K-T, etc., as being in the very forefront.

In the other means of transportation, the South is also outstripping the North. It is not commonly known that the South boasts three-fourths of the navigable rivers of the country. It is even less known that its shipping has risen so fast that it now surpasses New York and Philadelphia, the two great Northern ports, and San Francisco, greatest of Western ports put together. No city in the world has a harbor system as efficient as New Orleans.

But more than in any other transportation phase the South is winning out in highway construction. Here it is swinging out from the most backward section of the Union to the paradise of motorists. The South is spending twenty-five times as much on highways today as twenty years ago, whereas the rest of the United States is spending less than sixteen times as much. The South has more than kept pace with motor car development.

A more general survey than that of spectacular industries, basic fuels and transportation is in order. Although the population of the South since 1880 has not risen quite so fast as that of the Union, in true value of all property it has gone ahead at least as fast. The true value of all property in the South has gone up from 9 billions in 1880 to over 75 billions today.

But this takes into account all situations—the static farm as well as the growing industry. A true test is manufacturing growth. From 1880 to 1924 the capital placed in manufacturing industries rose from 330 millions to over 6.9 billions, an increase of 2,100 per cent. The rest of the Union advanced 1,500 per cent. Hence, the North was outstripped considerably in the rate of growth of industry itself.

Finance and Trade.

On the financial plane, the progress of the South is even more startling. From 1880 on (1880 is taken as the base because it is the first census year after the horrors of reconstruction), when bank deposits were only 190 millions, to 1924 when they surpassed 6.6 billions, the South has had a steady upward curve in credit resources. This increase of about thirty-five times, was not matched by the North and West, which increased only about seventeen times. When it is remembered that the North experienced the greatest industrial development known in the history of mankind, and that the Prairie West and Pacific Coast built up a new empire at this time, and that, despite all this the two together could not even half equal the rate of growth of the South, then it is clear what the South has accomplished. In exports, too, the North has not quite equalled the South, though here the contrast is not so spectacular. In imports, however, the southern totals have risen from the pitiful sum of 36 millions to 415 millions, and the North from 621 millions to 3.3 billions. The southern rate is more than double.

What Cannot Be Measured.

But tremendous as is the record of growth it does not tell the whole story. When Rome was tranformed from a city of brick into one of marble, mere statistics would give no great indication of the type of development. So in the case of the South. From a semi-inert economic community, it has become aggressive. From an agricultural community with only one metropolitan city, it is today the nursery of many great cities.

The foregoing figures, too, do not give a picture of the increase of the rate of growth itself. The development of the South is like that of a snowball rolling downhill. With only 300 millions in capital it could grow at only a medium rate. When it accumulated one billion the rate was accelerated. Now that it has ten billions of liquid capital, the rate ought to be astounding. For, if even on the impetus of smaller capital it has surpassed the rest of the Union, the future may give to it actual supremacy.

Apart from capital growth, the face of the land is not the same. Its standards of comfort and taste are rising daily. The American Riviera is here, the winter home of the Eastern states. Its day has only begun. A land boom or such other folly may cause some setbacks, but the sound economic basis of the South cannot be questioned.

Cooperation Between Mill and Finisher

It seems there still are at least two sides to every question, and sometimes, even more. In the September number of COTTON was published an article entitled "Cooperation Between the Grey Goods Mills and Finishers," prepared by Paul A. Merriam, and L. L. Bamberger, resident manager and superintendent, respectively, of the United States Finishing Company plant at Cedartown, Ga. This article stressed the need for a greater cooperation than frequently exists between the grey goods plant and the finishing plant, both producing for a common customer. Specific instances of practices which might be eliminated or altered with benefit were cited, and quite naturally, since the co-authors are executives in a finishing plant, their viewpoint represented that factor. Their contribution toward forming a spirit of greater cooperation was to show, by illustration taken from their own experiences, of what the grey goods mill might do in furthering the cause.

In a spirit of broad-minded fairness, however, and recognizing the limitations of their viewpoint, these writers generously suggested the publication of an article presenting the angle of the grey goods mill. In other words, an exchange of opinion and experience on the subject to aid in attaining an object of mutual benefit.

Since the appearance of the article, the editors of COTTON have received, along with other comment, several comprehensive expressions from representative mill men, by way of reply to this article, and based largely upon its statements. In pursuance of the suggestion made by the authors of the original article, therefore, some of these comments are compiled and presented in the following paragraphs.

In such discussion, it should be remembered, the same spirit of frankness that was necessary in presenting the finishers' viewpoint likewise is essential to the mill man in stating his position. It is certain that no thought of critical argumentation or antagonistic contention was involved in either the original article or in the replies and comments embodied here—but rather the broader view of constructive suggestion and of exchanging opinions.

The Customer Be Pleased.

One superintendent states that both the finishing plant and grey goods mill should remember that the customer is the one primarily to be satisfied. For, he points out, "after all the customer is the one who specifies what the selvage must be, and also the weave, and the packing, and the calendering; some want goods brushed, and some won't let us touch them." In view of the fact that most of the troubles mentioned in the finishers' article were presumably originated at the weaving mill, this man, while stating that he holds no brief for any mill, at the same time points out some other things which might happen at the finishing plant.

Messrs. Merriam and Bamberger, in their original discussion, indicated that improper selvages can give the dyer and finisher a lot of worry; that when light-weight goods woven with tight selvages are pulled through their machines, the tension causes breaks. There is another type of selvage, they said, which persists in turning in and forming so-called "double-edges," which give trouble in the tenter frames. In their opinion, a fairly wide tape selvage or a wire selvage are both better than a narrow tape selvage.

But, in the opinion of the superintendent being quoted,

"the style or width or weave of the selvage *is not always* the cause of the so-called curled or doubled selvages on calenders." He thinks this will be hard to secure cooperation on, "because, though the executive of the finishing plant may be all right, if the men inside the plant start a piece wrong and it curls or doubles, they immediately start a yell that the selvages were not woven right, and there is no way of telling how it was started. I have seen it done on calenders in our own mill. I do not mean there are no selvages that will curl, but if started correctly most of them will go through all right. Once we made and shipped to one finisher about 2,000,000 yards of a fabric, and never had a word about curled selvages; then we got an order to ship 100,000 yards to another finisher, and the "S O S" was sent out right away that the selvages curled and it was impossible to finish the cloth. There was nothing we could do as these goods were taken from the same lot, and the finisher who had the big consignment—everyone who handled the goods at his plant, in fact—said they had not the least trouble with curled selvages.

Can Selvages Be Standardized?

"A weaver can and does make any kind of a selvage the customer calls for, and a great many times he will make them as the customer says when he knows that the finisher will have trouble, like the narrow tape referred to by the gentlemen at Cedartown. No tape, even on narrow goods, should be less than three-eighths of an inch wide, and a half-inch is better. I have just finished an order calling for a selvage containing 24 ends, no more, no less. Of course, the goods were made that way, and probably the finisher will have a little trouble with them. Selvages should be standardized, and as no one knows so well as the finisher just what finishes the best, I think they should be standardized from his standpoint as far as possible."

Taking up oil spots on goods, this man calls them the "bug-a-boo of a weaver's life." At the same time he wonders "if the finishers have done as much to eliminate these as have the mills," pointing out that the mills are taking unusual precautions, some even rolling the cloth in paper as it comes off the loom, and that cloth rooms are kept clean. On the other hand, says this superintendent, "the average dyehouse is dirty, and even some of the warehouses are not clean, but if a piece of goods, after finishing, shows oil, the mill has no come-back. I think all mill oil should be shown up *before* dyeing. I think the finisher and weaver should visit each other's plants and make helpful suggestions as to the elimination of oil spots in both places."

This man relates two incidents to illustrate how cooperation sometimes is prevented through misunderstanding or a lack of the proper understanding. "Not so very long ago," he says, "I was shown a piece of cloth that had a streak after finishing, and was asked what I thought caused it, having to admit I didn't know. The dyer said it was a bad reed, but I put it over a glass with a strong light underneath, and traced the streak to a place where the intersections of threads were perfect. Another piece of the same finish showed the same kind of a streak, but it ran only about 30 inches. The dyer said he knew what did that, still he said the same thing in the other piece was a bad reed because it ran for 30 yards.

"Another time I was called to a finishing plant to see some finished goods that showed streaks about 15 inches long, diagonal in the cloth. I was told this was caused by creases—not calender pinches. I thought this might be so, but wondered how there could be so many since a loom rolls up fairly smooth. I asked to see the cloth in the grey, and sure enough, I was shown goods with creases. I asked to be allowed to mark several cuts. The superintendent would show me places which he said would make the streaks, and I would mark them with a ring. But when the goods were finished, while there were just as many streaks as before, there wasn't a single streak where I had marked a ring. About a week later they told me they had found the cause of the trouble!"

How Cooperation Pays.

The next mill man quoted is prominently known as the manager of a southern mill. His comments consist chiefly of specific illustrations wherein cooperation's presence saved him useless worry, and others when the lack of what to his mind would have been cooperation caused trouble which afterwards was shown to be unnecessary. He says:

"I think the most grievous fault that the finishers commit is that of going to the customer with anything that doesn't measure up to their idea of what the cloth should be. Certainly a good deal of prestige is lost by the grey mill man if he is constantly receiving complaints from the customer, these complaints having been forwarded to the customer and in turn finally sent to the mill. How much easier it might be for the finisher to get in touch with the mill and explain the trouble, as the mill might in turn suggest a way out of the difficulty. To give an illustration:

"We have long used in our cloth room an oil solvent that is employed to emulsify any oil spots that might be in the cloth, which will readily come out in the bleaching. This is a great time saver and a money saver, too. Well, recently we sent a shipment of domestic broadcloths to a bleachery, and we received word from the selling agents that the customer had notified them that the bleachery was holding up our shipment due to oil in the cloth. I went down to the bleachery and found no excuse of oil beyond what had commonly been in our goods, and learned they had never heard of this oil solvent and were afraid to take the risk of bleaching it. So I wired the selling house to advise the customer of the circumstances and request the bleachery to proceed with the goods. This was done and never a word was heard from the goods—except that we got a large repeat order from the same customer. If this bleachery had notified us first we could have explained the whole situation and the customer would not have been troubled at all.

"To show you how a large print works did cooperate with us in this manner: Sometime ago we had quite a large shipment of cloth which showed a faint pink mildew in the cuts near the selvages that had been near the floor of the warehouse. This looked like a very serious thing. However, the print works took a bale of the worst and bleached and printed it and found no trace of the mildew and no tendering of the fibers. Just a matter of cooperation, when they might have condemned the whole lot and lost a lot of money for the grey goods mill.

"Some finishers assume that most grey goods contain a good deal of rubber and can be stretched and pulled to whatever degree desired. This is not done by all, but by some. If finishers would not try to get too large a regain in yardage there might be a great deal of cracked selvages eliminated. I was once with a mill which had complaints from the bleachery, and it was found that the bleachery was getting a regain in yardage of over eight per cent. The cloth wouldn't stand it.

"Certainly the mills will welcome any suggestions which the finishers might give to get a better finished piece of cloth, and if the finishers will not hesitate to advise with the mills, it will be a boon to the bleachery or finishing plant as well as to the mill."

"It All Shows Up in the Wash."

A most interesting and instructive experience for the average superintendent or overseer is to visit and carefully inspect some finishing plant where he can see and compare the cloth of various mills. On such a visit, the mill man usually paraphrases the old adage, that "it all comes out in the wash," and says instead, "It all shows up in the wash." Conversely, an equally interesting and instructive experience for a finisher is to visit and study carefully the various processes in a grey cloth mill. "A little learning is a dangerous thing," for the mill man and finisher alike, and if there is to be cooperation between the grey cloth mills and the finishing plants, there must be then a more complete understanding of each other's problems.

Thus does another prominent superintendent present one means for arriving at the end in view. Taking up detailed causes of difficulties, he continues:

"It has been suggested that one of the greatest problems that the finisher has is the preparation of cloth for dyeing. Various ingredients used in sizing compounds are given credit for causing a great deal of trouble, and it is my suggestion that the grey cloth mills should exercise more caution in changing their size mix by first submitting sample pieces for finishing to determine if satisfactory results can be obtained. The mill that does not follow this practice can have no cause to complain when trouble is encountered by the finisher.

"Another trouble that is commonly laid at the door of the mill is that of broken or irregular selvages. Selvages that break because of unevenness can hardly be laid to the finisher, but where there is not irregularity the finisher should be quite certain that his own house is in order before passing the trouble to the mill. So long as finishers continue to take business at bargain prices and try to make their profit from the 'gain', it will continue to be difficult for them to convince the mills that their selvages are not all right when there is little variation in them. Any good selvage, whether wide or narrow, tape or plain, should run well in the finishing plant if the draft is not too heavy and the bite of the rolls in the finishing machines is uniform across the entire width of the cloth.

"Altogether we must deal frankly with each other. Finishers should tell their customers the mills that are making the best deliveries and they should pass back to the mills any legitimate complaining on their goods. This done, the mills can adopt no better policy than that of making every reasonable effort to avoid having any complaint occur more than once."

The Converter's Viewpoint.

So much for the mill man. The foregoing in no way covers the entire ground; it only represents individual opinions and experiences. It is indicative. But, passing along—

There is another angle to the situation which justifies the statement contained in the first sentence of this article —the viewpoint of the converter. Two comments on the subject from factors in this section of the distribution plan are of pertinent interest; one of them states that "it is evident the converter is the one who takes the punishment of faulty finished fabrics when the blame cannot convincingly be fastened on either the gray goods mill or the finisher: and he, himself, is not conscious of any flaw in his own performance." Departing from this line of thought, however, this converter offers the following specific suggestions:

"The experienced finisher can avoid many of his troubles if he is advised by proper markings on grey goods bales or on finishing invoices. These markings to show:

(1) The kind of warp sizing used,
(2) Whether goods are oil spotted,
(3) Whether oil spots are washed out, and
(4) Kind of oil remover used.

"All of this information is readily available at the grey goods mill. It would involve but a small amount of work to mark each shipment in this manner. The grey goods mill, the finisher and the converter would all be benefited. If this information were put on the invoices to the converter, he in turn could pass it on to the finisher on his finishing instructions.

Can It Be Done?

"The argument may be brought forward by some grey goods people that if this is what is wanted, then make it a part of the purchase contract. This can be done, undoubtedly, with some mills, but my idea is to make it a general practice and do away with the necessity of arguing it out on each contract."

This converter admits the difficulty of interesting the mills generally in such a change, since it would strike the average selling agent as a radical departure, "and with some commission houses anything that is different from what they have done for the last hundred years should be avoided at all costs. It is this attitude that has kept the textile business in its unprofitable and otherwise unsatisfactory state for the last few years."

As illustrating "the lack of cooperation that exists in the industry," this man says that "today it is even difficult to buy grey goods with the confirmation marked 'free from washed out oil spots', as some sellers will not commit themselves as to whether they do or do not use oil remover."

He adds, however, that "all selling agencies are not of this state of mind, since there are a few progressive commission houses who do not close their ears to the buyer's point of view." One large selling house, he points out, "has its mills send customers direct notice of the grey goods shipment," adding that frequently some converters do not receive invoices for grey goods until some time after their arrival at the finishing plants. The direct notice system makes it possible to instruct goods into process immediately on arrival.

The opinion which will be presented in concluding this compilation is that of Louis Bader, M.C.S., who, in discussing the subject, refers especially to points brought up in the article in the September issue, in addition to bringing out other angles by citing specific instances. Mr. Bader offers the interesting suggestion that the National Association of Finishers might compile a bulletin of what constitutes good practice on the part of the grey mills when goods are intended for further finishing processes, educating the finisher's customers along this line so that they in turn will ask the mill to conform thereto when they place their orders for quantities of various fabrics.

As an instance of cooperation, Mr. Bader cites the following: "Until a few years ago the cotton fabric commonly referred to as a grey jean was used very largely by trades requiring a bleached or light colored cloth. Now these same jeans are dyed in great quantities in the dark

sulphur shades which do not require the same preparatory treatment. At the start the converter had considerable loss through some of these goods coming out of the dye processes showing large stains. These stains were finally traced back to the use by the grey mill of some oil remover. This was perfectly all right since the use of some oil remover is necessary when goods are to be bleached, but otherwise not. Just as soon as the cause of this trouble was discovered and called to the attention of the mills, various mills took the necessary steps to cooperate with their customers to overcome this fault. Today when jeans are purchased from a grey mill the use to which they are to be put is stated and the mill sets aside against the order goods to be used for the particular purpose stated. This is but one illustration of perhaps many which might be cited to show that the grey mill will cooperate when asked to."

However, continues Mr. Bader, "there are times when to cooperate is not an easy matter. As, for example, when the question of what to do is still open for discussion, and the right thing that should be done has not yet been scientifically settled. This, however, does not seem to be the case with much that is pointed out in the article published in COTTON. The chemist ought to know what mixture of warp sizing materials is the best to used when goods are to be de-sized for further processing. The elimination of finishing processes by the grey goods mill is to the interest of the mill, since it will reduce costs. It would seem to be just a matter of stating what constitutes good practice when manufacturing grey goods for securing the best finished results and calling the mill's attention to this, to cause the necessary changes to be made.

Some Other Problems.

"This of course sounds very simple and partakes of the counsel of perfection, but human nature being what it is, it does not work out so easily when put to a practical test. But such effort is educational and like all education effort takes time to accomplish its purpose. Then, too, there are reasons which could be advanced by every grey goods mill to show that the cooperation asked for is in some cases impracticable. To illustrate, not all the goods manufactured by a typical grey goods mill are intended for dyeing. The average mill is necessarily equipped for quantity production, and its processes are adjusted as experience has shown will give them the best final result. Buying on the part of the average mill's customers has been for some time now on a hand-to-mouth basis, consequently orders are filled from goods in stock. If the customer buys goods which he intends to process further, under present circumstances, the problems presented by that particular mill's methods of manufacture, whether it be in the warp sizing used, incorrect selvage for further processing or a finished effect on the cloth, are for the dyehouse to solve as best it can. When once again sizable orders are placed by buyers, permitting the mill to make a run against such orders, the customer will then be in a position to specify what little changes may be necessary to secure better dyed and finished results.

"We are passing through one of those periods of keen price competition in the cotton industry. A corollary of such a period is extremely small profits and for many concerns none at all. Under a condition like this a mill is justified in holding down its cost of production all it possibly can. From that point of view it may not be wise just now to change any of the mill's present practices. In time, with improving conditions, some changes can be effected with advantage to all parties.

"Some of the other suggestions made, such as the marking of goods with a proper chalk mark and the proper packing of goods made under the same conditions, it would seem, could be complied with at once regardless of the use to which the product of the mill is to be put."

Laundering Methods and Cotton Colors

BY GEORGE H. JOHNSON

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A great deal of misunderstanding exists between the manufacturer of cotton goods and the launderer simply because neither, as a rule, is familiar with the methods used by the other. A colored fabric bleeds when laundered or fades after being hung out on the wash-line a few times (damp wash bundles) and immediately the conclusion is drawn that the laundry has used "bleach." Commercial laundries, as did everyone else, experienced considerable trouble when handling dyed and printed cotton goods during and immediately following the war. The launderer, however, understood the situation and realized that the acute shortage of suitable dyestuffs had more to do with bleeding colors than anything else. As long as black cotton stockings were dyed with direct instead of sulphur black the launderer understood the real cause of the trouble, but the public, unfortunately, did not. And so, even to this day, the commercial laundry is spoken of as being "hard on colors" when, as a matter of fact, the laundry industry uses far greater care with regards to supplies used, temperature control, duration of treatment, and drying than does the average housewife who does her own washing.

The present evil of misrepresentation, as practiced by certain converters and retailers has caused no little concern to the power laundry industry. In recent years, fabrics have been guaranteed as fast when Heaven alone knows to what this fastness refers. Under the circumstances, unfortunate experiences have occurred at times. The present practice of guaranteeing colored yard goods as being fast when they are not and of selling domestic merchandise as imported are two evils that are bound to injure the manufacturer and converter who believes in honest dealing. The attempt of the Converter's Association to do away with misrepresentation is a worthy one and should be supported by all who believe in "Truth in Advertising."

Colored goods of many kinds, both dyed and printed, are sent daily to the power laundry. They are colored with many types of dyestuff, some of which are fast and others moderately so. Still others are fugitive. It is the latter type of color that is causing trouble in laundries and homes today, so much so in fact that many commercial laundries have been driven to adopt cold-water washing methods for this class of work or else make almost innumerable separations. The accompanying table classifies cotton colors according to a laundering viewpoint:

COTTON DYESTUFFS.

Class of Colors	Properties
Basic Colors	These possess poor fastness to light and washing. They rub or crock badly and, when used, occur on cotton in bright shades of purple, green, red, or blue. They are also used to top duller cotton colors.
Phthalic Anhydride Colors	Like basic colors, they possess very poor fastness to light and washing, particularly when sodas are used. They occur only in pinks or reds, but are seldom applied to cotton.
Direct Cotton Colors	The fastness obtained varies entirely with the color used. The bulk possess poor fastness to light and only moderate fastness to washing. They are particularly fugitive to Javel water. This class of dyestuff is used extensively for coloring cotton fugitives. Sometimes certain colors may be rendered faster to light by after-treating with copper sulphate and acetic acid. Sodium bichromate and acetic acid render certain other colors of this class faster to washing. Formaldehyde and acetic acid possess similar properties and are used chiefly for cheap blacks.
Diazotized and Developed Colors	These are considerably faster to laundering than the ordinary direct colors, but are fugitive to Javel water.
Sulphur Colors	Fastness to light varies from good to bad. Blacks and greens are fast, sulphur yellows are not. They possess good fastness to washing but will not withstand Javel water.
Reduction Vat Colors	Although fastness to light and washing varies somewhat with the color, as a class they probably include some of the fastest cotton dyestuffs used. Many of the guaranteed fast-dyed fabrics are colored with vat dyes. Some withstand Javel water, but others are more fugitive.
Insoluble Azo Colors	These are chiefly reds and garnets that are fast to light and washing. They will usually withstand a mild bleach.
Mordant Colors	Turkey Red was formerly an important mordant color on cotton, but is seldom applied today in American mills. Such shades are fast to light and washing.
Aniline Black	An extremely fast black.

In addition to these, certain natural colors such as logwood and, occasionally, mineral colors are encountered.

The modern laundry classifies the colored work that comes to it somewhat as follows:

1. Light colored garments such as bungalow aprons, dresses and the like.
2. Dark colors that are suspected of being fugitive to soap and water.
3. Colored shirts.
4. Hosiery.
5. Knit underwear.
6. Overalls.
7. Colored curtains.
8. Colored woolens.
9. Colored silks.

Dark colors are generally sorted further and laundered one color at a time. Hosiery also is further subdivided into two groupings, light and dark colors, which, although laundered by the same formula, are washed separately. Only when cold-water washing methods are used are all cotton fugitives washed at one time. Light colored garments and shirtings are washed separately, although the same formula may be used for each. Badly soiled shirtings (except solid shades) are laundered at higher temperatures.

Of the above classifications of colored work, the cotton manufacturer is interested only in the first seven. Colored woolens and silks therefore will be dismissed without further remark except to point out that only cold or lukewarm (90°-100° F.) temperatures and neutral soaps containing no free alkali are used. Low temperatures are maintained to control the shrinkage of wool and the bleeding of certain silk colors, many of which are chosen for their beauty and clearness of shade rather than for fastness to washing.

Light Colored Work and Shirtings.

These include solid shades as well as figured designs, checks and stripes such as are found in percales, ginghams and the like. Light, solid shades on cotton goods are not laundered above 120 degrees F. Although many of these are able to withstand soap and alkali at such a temperature, others of cheaper quality, that are dyed with ordinary direct colors of the questionable fastness, give trouble. Some powder blues, pearls and tans, for example, may hardly be laundered successfully even at temperatures as low as 100 degrees F.

As a rule, very little trouble is experienced with prints, ginghams, and shirtings particularly in better class merchandise, because the vat, sulphur, developed, and fast-printing colors used are well able to withstand soap and builder like soda ash and trisodium phosphate. The following formula is recommended by the Laundryowners National Association for light colored work:

(100 to 125 pounds load in a 36-inch x 54-inch washwheel.)

1st Bath—Warm water (95°-100° F.); 5 inches inside the wheel. Add a mixture of 88 per cent neutral soap and soda ash to make a good suds. Run 10 minutes. (For ordinary colored work, three parts of soap and one of soda ash (by weight), or its equivalent, are used. Badly soiled work may require two parts of soap and one of soda ash.)

2nd Bath—Warm water (120° F.); 5 inches. Add soap and soda as before and run 10 minutes.

3rd Bath—Repeat.

4th Bath—Repeat.

5th Bath—Warm rinse (120° F.); 10 inches of water. Run 5 minutes.

6th Bath—Repeat.

7th Bath—Repeat.

8th Bath—Repeat.

9th Bath—Cold rinse; 8 inches of water. Add ½ pint of acetic acid or 3 ounces of sodium acid fluoride (harmless to cotton). Run 5 minutes.

Colored cotton shirts are laundered in a similar manner. Many, however, are sent to the laundry badly soiled, especially at the cuffs. This means that lukewarm washing will not cleanse the garments thoroughly, necessitating the use of temperatures between 140 and 160 degrees F. This does not apply to solid shade shirtings.

In order to give the mill chemist and dyer an idea of the concentrations of soap and alkali used in the washwheel, a table has been prepared based on a 300-pound load of goods in a wheel holding 151.7 gallons of water. A three-suds formula has been used in this case.

Suds	88% Soap	58% Soda Ash	Gallons of Water
1	20 ounces	7 ounces	151.7 gallons
2	8 ounces	7 ounces	151.7 gallons
3	4 ounces	3 ounces	151.7 gallons

Each time the wheel is dumped, about three-fifths of the supplies used enter the sewer. The actual amount of supplies used dissolved in a total of 450 gallons of water was 32 ounces of soap and 17 ounces of soda ash, based on 300 pounds of soiled clothing.

In the foregoing formula the cotton dyer and printer will observe four things:

1. Hypochlorites are not used by laundries that follow

the practices taught by Mellon Institute (1) and the American Institute of Laundering (2).

2. Solid shades are not laundered above 120 degrees F.

3. Striped and similar shirtings frequently are laundered at temperatures ranging between 140 and 160 degrees F. if badly soiled.

4. Soap and alkali are the only supplies used when laundering colored work with the exception of a sour in the last rinse.

Fugitives.

These include colors of poor or moderate fastness to washing which, because of their great solubility, bleed badly when laundered at high temperatures. This type of color has caused so much trouble to laundries that many have been forced to adopt cold-water washing methods or else make numerous separations. Spoken of as commercially fast by the trade, they are fast to nothing. When handling this type of work, the various colors sometimes are separated and laundered color by color at 90 to 100 degrees F. with soap and as little builder as may possibly be used and clean the garments. Because of the expense and trouble involved in such a method, many laundries use cold-water washing methods. Cold-water soaps are of two kinds:

1. Low titer soaps made from a red oil or similar base.

2. Potash soaps that are somewhat more soluble in cold water than soda soaps.

By using cold-water washing, the launderer avoids the numerous separations that otherwise are necessary.

Hosiery.

Hosiery, regardless of whether it be made of cotton, silk, worsted or rayon, is laundered by one and the same formula. The light colors, as has been pointed out before, are separated from the dark and laundered separately. Very little trouble is experienced with black cotton hose because the bulk of it is dyed with sulphur black. Brown and blue on cotton sometimes are fugitive because of being dyed with the ordinary direct colors. Whenever mixed fibers are used, the launderer has learned that the fastness depends entirely on the dyestuffs used. For this reason, temperatures of 90 to 100 degrees F. are used, never higher.

1st Bath—Lukewarm water showing 3 inches on the inside cylinder of the washwheel. Add stock soap solution sufficient to form a very high suds. Run 25 minutes.

2nd Bath—Lukewarm water to half cover the goods. Run 5 minutes.

3rd Bath—Repeat.

4th Bath—Repeat.

Knit Cotton Underwear.

Although a great deal of cotton underwear is handled in the bleached state, a considerable proportion of it is dyed. These include chiefly Egyptian and wool shades as well as random-dyed suits. While the use of hypochlorites such as Javel water is often advisable for white cotton underwear, chiefly for sanitary reasons, their use is not recommended for colored underwear. This is due to the fact that the direct cotton colors generally used to color knit underwear are not fast to bleaching agents. Dyed cotton underwear is never laundered above 120 degrees F. and then only with soap and alkaline builder. Many launderers wash knit underwear as they do woolens but use more suds. This is particularly true of fleece-lined underwear.

Overalls.

Overalls and workmen's garments of a similar nature are sent to the power laundry badly soiled and covered with grease. Under the circumstances, there is no excuse for a dyer using colors that are fugitive to washing. Sulphur colors or Indigo are of the type that should be used. Until recently, laundries as well as housewives experienced considerable difficulty in properly cleaning badly soiled overalls. Treatment with soap and alkali in hot water was the standard treatment. During the past year, however, a new formula has been worked out that not only cleans greasy pieces, but also permits of the use of lower temperatures.

1st Bath—Warm water at 100 degrees F. Run 5 minutes.

2nd Bath—5 inches of water at 140 degrees to 160 degrees F. To a 100-pound load add 5 pounds of soda ash and 8 pounds of common salt (NaCl). Run 15 minutes.

3rd Bath—Repeat.

4th Bath, etc.—Rinse until water runs clear.

This formula is highly successful and is being adopted by laundries all over the country. In a 36-inch x 54-inch washwheel, a 5-inch water level means that 90 gallons of water is being used in the suds.

Colored Curtains.

Colored curtains, chiefly ecru, are often sent to the laundry in a faded as well as soiled condition. Curtains are always washed in nets. For this reason very little trouble is experienced, unless the curtains have been damaged by sunlight, with one exception. Certain types of curtain material consisting of a cotton warp and a rayon filling may hardly be laundered successfully due to the extreme smoothness of the filling. In many cases the weave is distorted badly because of the way in which the warp slips over the filling. Generally there is always a slight shrinkage when laundering curtains. When the operator attempts to stretch them to their original size, the rayon, weakened by water, sometimes breaks. There is room for improvement in the design of certain curtains containing a rayon filling, at least as far as launderability is concerned.

Colored curtains are washed according to the following formula:

1st Bath—Water at 100 degrees F. Use a good grade neutral soap to produce a suds. Run 5 minutes.

2nd Bath—100 degrees F. Add soap as before and run 10 minutes.

3rd Bath—Repeat if the curtains are badly soiled.

4th Bath—Rinse in water at 100 degrees F. for 5 minutes.

5th Bath—Repeat.

6th Bath—Repeat.

7th Bath—Cold rinse for 5 minutes.

In this brief manner, the methods commonly used by power laundries when handling dyed or printed goods have been discussed. It has been thought that this information would be of value to mill chemists and colorists. Several things will be noted, of which the following are most important:

1. For 10 years the Laundryowners National Association has sustained a fellowship in Mellon Institute of Industrial Research, Pittsburgh, Pa., where chemical and textile problems relating to the science of laundering are studied for the benefit of the industry.

2. For three years the Laundryowners National Association has supported the American Institute of Laundering at Joliet, Illinois, where the problems of the industry are studied on a plant scale. Mellon Institute serves as the laboratory and the American Institute of Laundering as the proving station to the laundry industry.

1. Colored goods are never boiled in the commercial laundry.

2. Hypochlorites are never used on colored work by laundries that follow the recommendations of the Laundry-owners National Association.

There are laundries, of course, outside of the Laundry-owners National Association's influence that no doubt use questionable methods. At the same time such washing methods are not countenanced for a minute in the well-conducted washroom. The washing formulas used by the modern and efficient laundry of today are not "hard" on colors of reasonable fastness. Trouble is experienced only with that group of colors that is referred to as being commercially fast.

Testing and Standardization in the Cotton Industries

BY W. F. EDWARDS

DIRECTOR OF LABORATORIES, UNITED STATES TESTING COMPANY, INC., AND CHAIRMAN OF COMMITTEE D-13 OF THE AMERICAN SOCIETY FOR TESTING MATERIALS.

Cotton has been used as a textile fiber from time immemorial in countries like India where the cotton plant is native. Today the cotton fiber is the most important commercial vegetable fiber in all countries of any considerable commercial importance even though the cotton plant may not be native and can not be grown in the country. The United States has no native cotton plant but yet is the largest producer of raw cotton in the world, producing around sixty per cent of the world's manufacturing supply.

Testing and standardization of yarns and fabrics and the processes of manufacture in the modern laboratory way were unknown in any of the textile industries until very recent times and with the exception of the valuable silk, which was tested in a fairly scientific way for moisture content as early as 1842 at Lyons, they may be said not to have come into general use until after the close of the nineteenth century.

Marked increase in the consumption of cotton has taken place since the beginning of the twentieth century due in large measure to:

(1) Increasing wealth of the whole world and consequent display in dress.

(2) Improved methods of manufacture which have introduced new processes making it possible to produce a variety of new products of quite different character, quality and finish from those previously made, such as those due to new mercerizing processes, schreinering, etc.

(3) Use as substitute in part in yarns and fabrics made from other textile fibers.

(4) Large consumption of mechanical cotton fabrics such as tire fabrics, hose ducks, belting ducks, and aeroplane cloth which acquired an enormous importance during the World War.

(5) In entirely new forms of fabrics such as knitted garments of many kinds and knitted piece goods.

(6) Increasing consumption for pyroxylin products and rayons (artificial silks).

The growing demand for improvement in mechanical fabrics made from cotton, and the increasing use of it as substitutes, and keener competition together with larger units of manufacture, have brought about a new condition wherein the older method of judging quality by inspection based on a ripe experience passed along from generation to generation has become inadequate and generally unsatisfactory. Nevertheless, modern testing and standardization has been very slow in coming into practice in the textile industries and it is only within the last ten years that the value of its general application to determine the quality of finished products has become quite commonly recognized.

This recognition has not been followed by universal adoption and use even of the well established quantity and quality tests.

Commercial transactions have usually introduced quantity tests before using quality tests probably for the very sufficient reason that quantity tests based on weighing were always easy to do and understand. The standardization of quantity tests usually involves standardization of the method of taking a sample as well as the methods of testing it.

The oldest commodity quantity test applied to textile fibers is the determination of the moisture content. This has been applied to transactions in raw silk as a quasi standardized method since the establishment of the Talabot méthod at Lyons. The price of silk has warranted the test, even on a single bale, since paying for one pound of excess moisture was usually sufficient to offset the cost of the test and five pounds excess moisture could be added to one bale of raw silk without apparent change in the silk. In the case of cotton it requires a considerable number of pounds of excess moisture to offset the cost of the sampling and testing but it should be noted that cotton is usually sold in much larger lots than raw silk and the sampling and testing of the lot may be done under a standardized method whereby the cost for the lot would be a small fraction of one cent a pound.

The determination of the moisture of a lot of 1000 bales could be done in much the same manner as is used for paper pulp. Probably a sample taken in a standardized manner from each tenth bale would give a fair average sample as to moisture content and the average of two moisture determinations from two portions of this mixed sample would if checking within one-half per cent give a fair average moisture content for the 1000 bales. Placing the cost of sampling and weighing at 40 cents a bale the cost of sampling the 1000 bales, (each tenth bale) would be $40.00 and making the moisture test and other costs $10.00 more would make a total cost of $50.00 for the 1000 bales, or five cents a bale. This cost would be covered by one-half pound of excess moisture when cotton is selling at only ten cents the pound and by proportionately smaller amounts as the price of cotton is higher. One pound of excess water represents only one-fifth of one per cent of the weight of the bale taken as 500 pounds.

This estimate of the cost of sampling and testing and weighing a 1000 bale lot is probably about what would work out if the practice of testing for moisture became general, but when cotton is selling at 20 cents a pound an excess of one per cent of moisture content means paying out $1000.00 for 5000 pounds of excess moisture which could be

avoided by paying out $50.00 for the determination of the moisture content at the prices suggested.

The same reasoning may be applied to lots of yarns but the lots would probably be of smaller quantity, say 100 cases of 100 pounds each in order to make computations easy. Sampling and weighing costs would not be very much more per case than was estimated above for the bale of raw cotton. Sampling ten cases at 50 cents the case (ten cents a case more than for a bale of raw cotton) would be $5.00 and the moisture determination would be the same as for the raw cotton, $10.00, making a total cost of $15.00, which, spread over the 10,000 pounds, would be less than one-sixth of one cent a pound. An excess of one per cent in the moisture content would be 100 pounds for the lot which would require paying out $20.00 for excess moisture at the low rate of 20 cents a pound for yarn, or one-third more than the cost of sampling, weighing and determining the moisture content at the prices suggested. These costs would be increased if the sampling included weighings so as to compute tare.

The moisture content is a significant factor in the determination of the average size or count of a yarn which is another important quantity test for the purpose of calculating the relation of the weight and yardage.

The large increase in the use of heavy cotton fabrics such as tire fabrics, belting ducks, hose ducks, aeroplane cloth, etc., wherein one of the qualities is based on the strength and stretch of the fabrics brought about a genuine desire for a standardized method of determining these properties.

A standardized method for the purpose was outlined and proposed as a tentative standard to be tried out before adoption as standard, by Committee D-13 of the American Society for Testing Materials ten years ago, soon after the organization of the Committee.

The try-out showed discrepancies so large between results from different laboratories on the same fabric that they could not reasonably be explained as experimental errors. The investigations looking to a possible explanation soon discovered that at least two factors of importance were involved; one was the type and range of the testing machines and the other was the moisture content of the yarn or fabrics at the time the strength test was applied.

It was found that the strength increased very materially with increase of moisture content. An investigation was made of the relation of this increase in strength with increase of moisture content and resulted in the Committee accepting a correction formula based on moisture content at the time of test for breaking strength. The formula is:

$$\text{Tensile Strength Corrected to Standard Moisture Regain} = \text{Ten. Str'gth from Machine Read'g} \times \frac{100 + (\text{Rate} \times 6.5)}{100 + (\text{Rate} \times \text{Actual Percentage Regain})}$$

The rate is approximately three-eighths of the weight in ounces per square yard or 3.00 for 8-oz. osnaburg, 6.40 for 17¼-oz. tire duck, 11.25 for 30-oz. belt duck and 18.75 for 50-oz. heavy duck.

Future work is toward extending this formula to make corrections covering conditions when tests are made on fabrics in moisture equilibrium with humid atmospheres above the standard atmosphere of 65 per cent relative humidity. Also it might be pertinent to investigate further the effect of temperature on strength and stretch.

The investigation on the type and range of testing machines has led to the proposal of a tentative standard for the type of machine to be used in obtaining breaking strength and stretch, and for the range over which a machine of given capacity may be used without introducing errors greater than can be accounted for by reasonable experimental errors when the characteristics of the material tested are given due consideration.

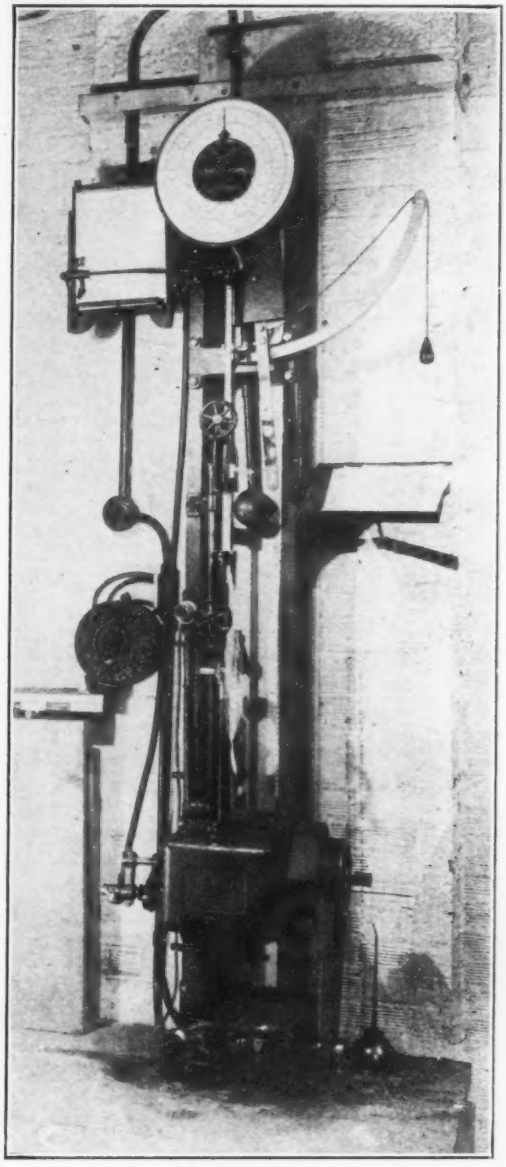

Fig. 1. Showing Method of Placing Band of Yarn in the Testing Machine.

Moreover, these investigations have discovered the desirability of knowledge of the relation of stress-strain diagrams showing the relation of stretch to the stress applied up to the breaking stress both in the case of yarns and fabrics and of a comparison of the single strand and skein tests in the case of yarns and of the strip and grab methods in the case of fabrics.

In the case of yarns this comparison is not at all satisfactory inasmuch as the skein test does not register the true

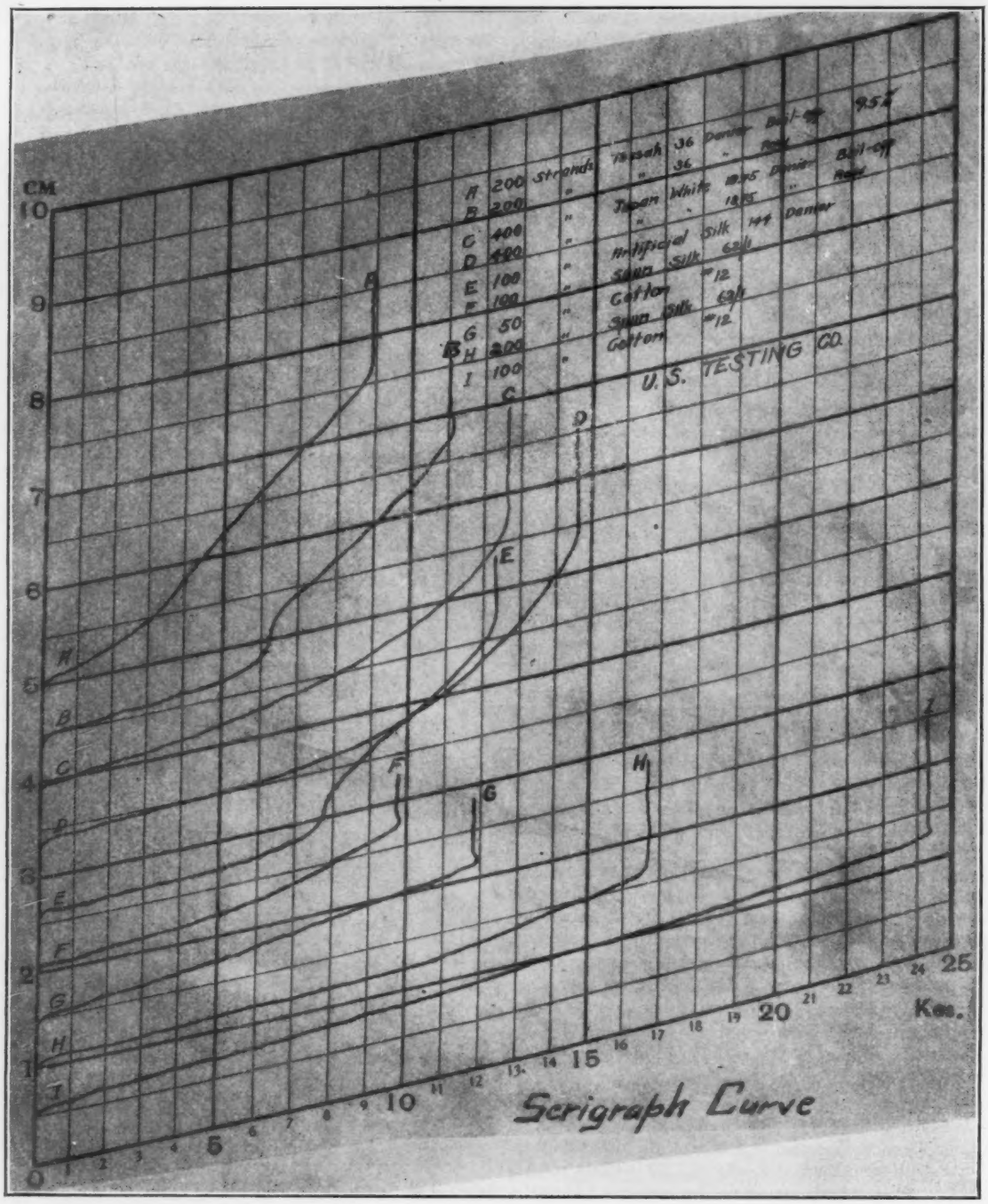

Fig. 2. Showing how Stress-Strain Charts furnish characteristic curves for different kinds of yarns.

stress on the yarns and the single strand test is incapable as yet of furnishing a composite curve to give the relation between stress and stretch.

On this account some investigation has been started to ascertain the utility for cotton yarns of a method of test that has been applied to raw silk with success for a period of five years and known as the serigraph test. This test is made by placing the 400 threads of a regular raw silk sizing skein in the upper jaw of an inclination balance type of combination yarn and fabric tester, with the threads spread evenly so as to make a band about three-fourths of an inch wide. The lower jaw is clamped to the band with a distance of ten centimeters (four inches) between jaws and the jaws are separated at a speed of six inches per minute instead of the usual speed of twelve inches per minute. The method of placing the band is shown in Fig. 1.

The strength per thread is given by dividing the total strength by the number of threads in the band used. This number will vary somewhat according to the count of the yarn.

Preliminary tests only have so far been made on cotton yarns and these were made at a speed of twelve inches per

minute with the results given in tables *A*, *B*, and *C*, and given here as suggestive only with a hope that some one may become interested to doing some work to furnish more data.

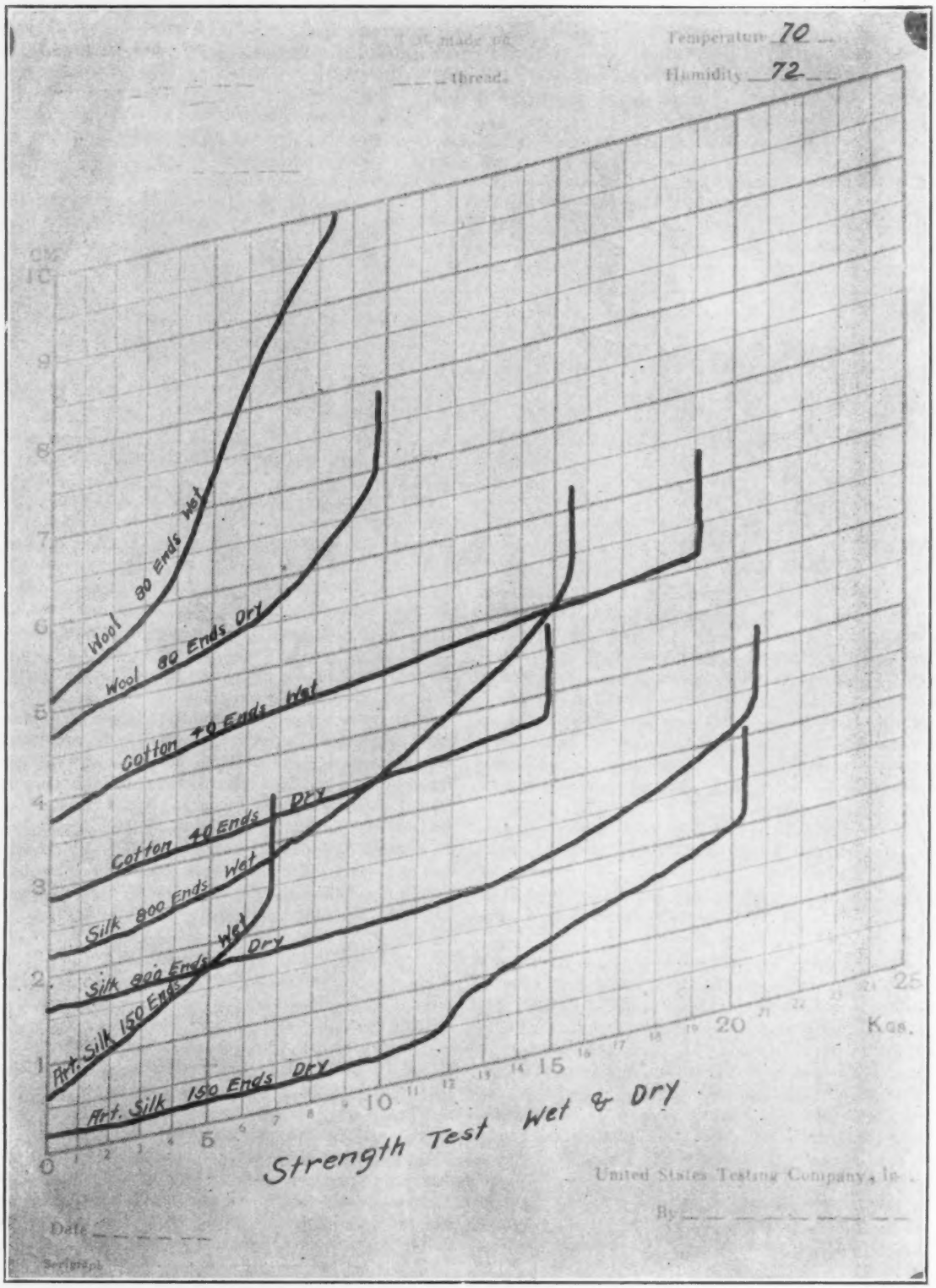

Fig. 3. Showing variation in the curves of like yarns at normal moisture content and when wet.

TABLE A.

Showing a comparison of strength and stretch of cotton yarns by single strand, lea and serigraph method with variable distance between jaws. The numbers are averages of five tests.

	60's Single		80/2 ply	
	Breaking Strength	Elongation, Per cent	Breaking Strength	Elongation, Per cent
Single Strand ...	3.4 oz.	3.50	9.2 oz.	3.7
Lea	24.1 lbs.	3.05	65.6 lbs.	3.04
Serigraph Between jaws				
3 inches	17.2 lbs.	4.93	45.3 lbs.	6.96
5 "	16.1 lbs.	3.62	43.1 lbs.	4.84
7 "	14.7 lbs.	3.80	40.6 lbs.	4.50
10 "	14.2 lbs.	3.38	38.6 lbs.	3.46

TABLE B.

Showing comparative strength as found by single strand, lea and serigraph from data in Table A.

	Single Strand	Single Strand × 160	Lea	Single Strand × 80	Serigraph 3"	5"	7"	10"
60's Single	3.4 oz.	34 lbs.	24.1 lbs.	17 lbs.	17.2 lbs.	16.1 lbs.	14.7 lbs.	14.2 lbs.
80/2 ply	9.2 oz.	92 lbs.	65.6 lbs.	46 lbs.	45.3 lbs.	43.1 lbs.	40.6 lbs.	38.6 lbs.

TABLE C.

Showing comparative elongation by single strand, lea and serigraph from data in Table 3.

			Serigraph			
	Single Strand	Lea	3"	5"	7"	10"
60's	3.50%	3.05%	4.93%	3.62%	3.80%	3.38%
80/2 ply...	3.70%	3.04%	6.96%	4.84%	4.50%	3.45%

A comparison of these tables shows that the lea test gives strength lower than the single strand multiplied by 180 and higher than the single strand multiplied by 60 and that the serigraph test gives values very approximately 60 times the value found by the single strand test so that the serigraph method gives at once by the reading on the chart the average strength of eighty threads. Also that the elongation for the ten-inch serigraph test, and the single strand test are closely alike while the lea test gives somewhat lower results. The high elongation from the 3-inch test is to be expected as the 12-inch screw speed is too high for such short lengths between jaws.

More data must be obtained before any working conclusions can be drawn. Moreover it should be noted that these preliminary tests have been made on finer sizes and may not work out so well on coarser yarns. As indicated above, this data is given with the hope that it may encourage some who have the yarns and equipment to do some work which will add to this data enough so that some working conclusions may be drawn and the method become standardized for cotton yarns if found to be an improvement on other methods.

Figure 2 is given to show how stress-strain charts furnish characteristic curves for different kinds of yarns. Notice that curve H for spun silk has the characteristic of curve I for cotton yarn and not of curves C and D of raw silk. Curves H and I are characteristic of spun yarns in general.

Figure 3 shows the variations in the curves when made in like yarns when containing the normal amount of moisture in standard atmosphere and when wetted by dipping in water at room temperature for a few seconds and tested while wet. It will be noticed that wetting decreases the strength of art silk very much without increasing its elongation very much, decreases the strength and increases the elongation of raw silk, increases the strength without much change in elongation of cotton yarn, decreases the strength slightly and materially increases the elongation of woolen yarns.

I have devoted the greater part of this paper to strength, elongation and stress-strain diagrams and moisture content as these are now generally recognized as important tests on yarns and fabrics. It will be seen that there is yet much desirable investigation to be done along the line of the stress-strain diagrams.

A tentative standard for obtaining the average strength of cotton fibers based on the serigraph method has been proposed by Committee D-13 of the American Society for Testing Materials under Serial Designation D152-22T. It has not been given a sufficient try-out to warrant adoption as standard. There is no unsurmountable difficulty in working out this test so as to give stress-strain diagrams on charts. This would doubtless prove very serviceable in the study of yarns.

It will be seen that there is opportunity and need for accumulation of data from different laboratories on methods already proposed and that there are many fields for future investigation that are sufficient to occupy all the unused time and equipment of the technical textile laboratories for a long time. The utilitarian value thus far shown for this work should encourage us to use all spare time to further its development and application.

N. C. Mill Men Enjoy Pinehurst Meeting.

Social features predominated at the fall meeting of the Cotton Manufacturers' Association of North Carolina, which was held on November 27th and 28th at the Carolina Hotel, Pinehurst, N. C. The chief feature was the usual golf tournament, in which a number of prizes were awarded to members and guests. R. Baldwin, of Marion, was the winner of the first prize for members, with P. Huber Hanes, Jr., of Winston-Salem, second. John L. Dabbs, of Charlotte, copped the first guest prize, with Charles H. Stone, of Charlotte, in second place.

The regular banquet was another high spot of the program. Samuel F. Patterson, president of the association, was toastmaster. Governor A. W. McLean, of North Carolina, and President E. C. Brooks, of the North Carolina State College, who were honor guests, spoke briefly at the banquet. Edward James Cattell, of Philadelphia, was the principal after-dinner speaker, injecting his usual happy vein of thought and philosophy into the occasion.

The Goodfellows Quartet of Charlotte, who have entertained the association previously, furnished the music for the banquet.

Mrs. Leroy W. Springs, of Lancaster, S. C., was elected a life member of the North Carolina association. Mrs. Springs is the wife of one of South Carolina's prominent textile manufacturers, and has the distinction of being the only woman ever nominated for the vice-presidency of the United States, this honor coming at the Democratic national convention in 1924.

The business session of the convention was held on Saturday morning. The adoption of resolutions was the chief feature, together with committee reports. Resolutions condemning the present system of crop estimates by the Department of Agriculture; endorsing tax reduction measures, and expressing regret over the loss by death of members during the year, were unanimously adopted.

Link-Belt Co., 910 S. Michigan Ave., Chicago, have opened a Milwaukee, Wis., office in the 1st Wisconsin Natl. Bank Bldg., in charge of R. C. Kendall.

Vision the Prime Essential for 1926

BY RUSSELL BYRON WILLIAMS.

Introspection calls forth retrospection. Without the perspective provided by yesterday we cannot properly view tomorrow. It is not only fitting but necessary, therefore, that we take into consideration past events before discussing present indications. This, however, can be done in one statement: *engineering and science have assumed control.* In that statement is wrapped all the development of the past fifty years. In it will be found deeper-going and farther-reaching effects than can be found in any other statement relating to commercial affairs. Science and engineering have taken command—with the result that we are entering upon an era of industrial expansion and activity without parallel in history. This contention is supported by evidence on every hand. Never have we had so much on the constructive side of the ledger to contribute to optimism. So true is this that the manufacturer, wholesaler or retailer who does not make money during 1926 will have only himself to blame.

Let no one believe, however, that the business prosperity that is most certainly here to stay will bestow its fruits upon everyone wishing for endowment. As never before hard work and vision are prime essentials to profit. Because science and engineering are now in the saddle we are moving with great rapidity. The trend of today is toward simplification and unity. There is no longer a "backwoods section" of the United States. Few, anywhere. The world is getting acquainted with itself. An important discovery or a vital message is known the world over twelve hours after delivery. Discussion of world events, at the time they happen, is now commonplace.

Outside the field of communication we find all industry moving with a speed heretofore unknown. While it took hundreds of years to progress from the stage coach to the steam railroad, it took but twenty years to develop the automobile. Eighty years were spent in the development of the telephone; four years, the radio. In fifteen years we not only learned how but adopted the methods whereby we could extract indigo from coal, and thus almost wipe out of existence an industry that had flourished in India for a hundred years. The development of rayon has thrown thousands of Japanese silk workers out of employment, and imposed a tremendous production burden on our own textile and paper industries—all in ten years.

Had railroad executives possessed the vision of Haynes and Ford twenty-five years ago, they would have built concrete roads along their right-of-ways, paid for them through tolls, and thus capitalized their competitor, the automobile, at the same time obviating the necessity for state governments to expend enormous sums for highways which must be met with taxes. The phonograph folks lost millions in reduced machine and record sales before they learned the wisdom of recognizing and cooperating with their competitor, radio. Electricity has outstripped manufactured gas as a utility largely because the gas men have kept their eyes glued to the kitchen range, to the exclusion of the larger opportunities in house heating and industrial usage. Criticism and protest from street-car companies failed to obviate the necessity for either serious competition or straight-forward cooperation with the motor-bus. Not ten per cent of the wood furniture manufacturers were prepared to meet the competition of steel. We move rapidly now-a-days, and the end is not yet. Hence the need for vision.

It is a trait of human nature to unsuccessfully visualize coming changes. We are all too prone to view tomorrow by what we know and do today. Our foresight is never as good as our hindsight, and too often we believe that by guiding our steps by past experience we are performing wisely. That trait has cost us untold millions. The characteristic in human nature that makes us reluctant to accept anything that may disrupt the even tenor of our ways has cost us incalculable commercial progress and uncounted years in development. In spite of all the lessons of history we are wont to live and think in terms of the present. Tomorrow, for most of us, is a negative quantity, and we therefore just sit tight and take our chances. With emergencies arising as rapidly as they are today, this is dangerous practice.

There is no lack of evidence of the value of vision. Proof of the dollars and cents reaction from the exercise of foresight is on every hand. Mr. Hill believed in that barren expanse lying west of the Red River of the North—and he built the Great Northern railroad. The Astors and the Vanderbilts invested in Manhattan Island property long before the average man could dream of the extension of New York City. At the time these men started they had no more money than we. Just greater foresight—and an absence of the reluctance to take the necessary steps. The American Telephone and Telegraph Company even now has cables stretched across the continent sufficiently large to care for increased population and demand for the next fifty years. When radio began to flare into popularity that company lost no time in securing for itself a dominating position in its development. Because of this action, they are now so large a factor in the radio industry that they can largely shape the course of its development. No stone is left unturned in their search for inventions that may have even a remote influence on their business. They recognize the truth that all industries are closely inter-related; that a development in the manufacture of one product may seriously affect a totally different product.

What Has Been Done.

If we are to look ahead with vision—that we may look backward with pride—we must recognize what has gone before, then keep in touch with the trend of times. Here are a few of the developments of 1925 that may have passed you by unnoticed:

Radio has been spoken of. Let us look at just two of the multitude of developments that have been brought forward,—then drop its consideration for more concrete things. Experts have recently perfected an ultra-audible microphone, one that will pick up insect voices. This microphone, working in connection with the device that transmits mirrored reflections, opens up a whole world of sound and activity for scientific and practical research as yet untouched. Another man has perfected a little 2½-inch cylinder through which, it is said, only certain sounds can pass. This means that all sound entering the radio can be filtered and that there will be complete elimination of all static. Radio will play, also, a very important part in

transportation. Aviators are not greatly impressed with ground lights. Too often weather conditions render them ineffective. Radio is always dependable. It will be used to guide airplanes in night or trans-oceanic flight—and freight planes by day. Not long hence we may see freight planes carrying Montana wool or Georgia cotton to the textile mills of New England, which will have no need for men, but will be guided entirely by radio. Dispatched by one station they will be caught by another.

At one of our large eastern laboratories, roentgenologists have developed what is known as the Gamma ray. This electrical ray makes possible the ionization of our endocrine glands. Through such ionization the progress of old age can be definitely retarded, according to one of the directors of this concern. If his statement be true (and considering other developments we do not flatter our intelligence by being overly skeptical) we stand today on the threshold of an era in which the halting memory, the wrinkled skin, the stiffened joints, the listless gait, the lusterless eye, will all be eliminated, or at least definitely retarded, through the application of the Gamma ray. Perfection of this scheme would enable us to retain our physical vitality and mental activity far beyond the age of 90. Recognizing the fact that in 1789 the span of life averaged 35.7 years, whereas the period of expectancy at birth now extends over 55 years, the realization of such results as those claimed for the Gamma ray seem not impossible.

Making Hens Lay Five Eggs a Day.

You were entirely justified in your belief that a hen could lay but one egg a day—until last year—when scientists discovered that through the application of the ultra-violet ray hens could be made to lay more than their time-honored quota. In one experiment, with a hen that laid 29 eggs in January, she actually laid 147 eggs in February—and simply through the application of the ultra-violet ray. This scheme, furthermore, is no more harmful to the hen than the employment of electric light, which poultry raisers have used for years. Illumination merely insures a steady yield, whereas the ultra-violet ray accelerates production.

Non-rot wood is now being made from saw-dust. Seed oysters are now being propagated in hatcheries—heretofore considered an impossibility. Florists have found a way to give perfume to odorless flowers. Slate is being incorporated into rubber to lengthen its life and increase its durability. High-grade potash is being obtained from sun-flower ash, the yield being upwards of 200 pounds to the acre of sun flowers. Artificial silk is being made from spruce wood and cotton waste. Sharks, formerly the most undesirable of deep-sea tenants, now contribute their skins for the manufacture of belts and bags, their oil for medicinal purposes and their eyes for jewelry. Metallurgists have produced a new metal so hard it will turn in a lathe, yet so porous it will absorb oil like a sponge. It will be used for installations that have heretofore lent themselves with difficulty to lubrication. Eucalyptus oil is now being made to produce a high-powered gasoline. Electric power is being generated from the wind, by means of wind-mills. Spider-webs are being cultivated in Europe where they are transferred to gummed cards, treated chemically to harden and water-proof them, then used for trimming on women's hats. Delicate instruments now predetermine the occurrence of earthquakes, and scientists in Washington and South America have been predetermining the general trend of the weather, with considerable accuracy, two and three years in advance.

Are you wondering what all this has to do with your particular business? Such a list of facts could be continued over many pages. The few that are given are set down here to force home the realization that many of the recent developments affect us and our business—that in the interest of ourselves and our industry, we must keep abreast of the times.

Developments to Come.

However far we have progressed, past developments will be minor in comparison with the developments that are coming. By 1930 this country will be honey-combed with air-routes, and passenger, express and freight aerial service will have become an important factor in our commercial life. The privately owned freight planes now plying between Chicago and Dearborn are saving the Ford Motor Company $1,000 a week in time and money. Such economies will immensely augment the demand for freight planes, and heavy demand brings large production and low prices. With low prices and the development of landing facilities will come wide adoption of the passenger plane.

There will be comparatively few gasoline-driven automobiles in the United States by 1950. At our present rate of consumption the oil reserves of this country will be largely exhausted in 12 or 14 years. At the same rate, we will exhaust the known reserves of the world in about 20 more years. Even now the high cost of gasoline is curbing the growth of the automotive industry in Europe and within a few years—ten or fifteen—we will see a like development here. The lack of an adequate supply of gasoline, however, will fail to stem the oncoming tide of motor vehicles. During the past ten years motor truck traffic has increased itself 100 times. While this rate will probably not continue, the saturation point is a long way off. But the motor vehicle of the future will be electric or steam—power of a kind that has steadily decreased in production cost since the beginning. Electric trucks, with trailers, will become an increasingly important factor in transportation. Streets in metropolitan centers will be two and three level thoroughfares, and the paved roads of the country will be built to withstand much heavier traffic than is now allowable.

This is not imagination. Merely a few facts to set you right on what is coming and coming fast. Earnest cogitation, with a pencil and paper, will prove their accuracy. The transit commission of New York City estimates that the metropolitan area will house over 10,000,000 people by 1935—17,000,000 by 1960. At that time more than seven millions will be forced to use suburban service at least twice daily. Thoughtful students of industrial trends and commercial development do not hesitate to say that Chicago will surpass New York City in population and commercial importance within the next fifty years. The development of the St. Lawrence waterway, the opening of the canals to the Gulf, and the development of aerial transportation, all afford certain foundation for the foregoing prophecies.

By 1950 the population of the United States will be, according to the most conservative estimates, about 150,000,000. To care for that number in the matter of food and clothing alone, we must greatly increase the attraction of agriculture. Radio, automobiles, paved roads and airplanes will do this. In the matter of transportation, we must

have more than fifty per cent greater facilities since demand increases out of proportion to population.

One cannot contemplate the increases in population, the changes in commercial activity, or the tremendously augmented demand for all commodities, without realizing that with them must come added responsibilities and the development of far-reaching improvements. Hence the assertion that the prophecies made here are in no wise fanciful. Rather, the few that are given have been based on the conclusions and conviction of the most thoughtful and most conservative observers.

At no time in history has there been greater need for the exercise of foresight with respect to coming changes. People who are self-sufficient, who do not keep abreast of the times because of the delusion that they have the world by the tail, will likely find themselves occupying an exceedingly precarious position in the early tomorrow. Never before has it been so necessary to maintain vigilance over what is going on in the fields of science and research. Political intrigue, racial misunderstanding, and unsound national ambitions cannot continue against the forces of engineering and science. In like measure, "glorious isolation" in business is as much a something of the past as the old pick and shovel. Through engineering and science there has been developed a bond of direct relationship between every industry—between every enterprise. In the manufacture of such wholly different products as ink, condensed milk, cement, salad dressing, nitroglycerin and sugar, several identical engineering chemical processes are used. Hence it is, the welfare of one affects the welfare of all.

In the past, developments of far-reaching importance came about slowly enough to permit of easy adjustment. Today they rise with startling rapidity, and unless we keep abreast of the trend we will be forced into the positions afforded followers. "Where there is no vision people perish" contains more truth today than when written. Vision is the prime essential for 1926.

Will Argentina Grow Cotton?

BY ERNEST L. TUTT.

CHIEF, COTTON MARKETING DIVISION, MINISTRY OF AGRICULTURE OF THE REPUBLIC OF ARGENTINA.

The high prices paid for cotton during and since the world war have caused many countries which before had not been growing cotton on an important scale to become very interested in its production. There are many parts of the world in which cotton will grow prolifically but comparatively high prices are necessary to make it profitable during the first years, while its cultivation is being established. Not all countries who take up cotton cultivation under the influence of high prices continue to grow cotton when prices again seek a normal average low level. The stimulus of high prices, however, causes many new countries to learn they can produce cotton and therefore places them always in position to jump in and cultivate cotton when prices make its cultivation profitable. In time, as the world demand for cotton increases and gradually raises the normal price of cotton, and as the new countries gradually build up more experience in its cultivation, certain new countries are going to find themselves in position to compete with the old cotton producing countries of the world. In time, one by one, these new cotton producing countries will seriously begin the cultivation of cotton with the intention of not stopping because of a decline in prices.

New countries who have serious desires to become cotton producers should understand in the beginning that they are obliged to compete with many other cotton producing countries in all parts of the world. The continued production of cotton in any country depends on its ability to compete with the large producing countries in cost of production and in cost of marketing.

Favorable Factors in Argentina.

Argentina presents certain very favorable factors which may make it possible to continue producing cotton in competition with other countries. It would appear at first glance that Argentina could easily make much higher profits from cotton than the average profits of cotton producers in the United States. The United States Department of Agriculture estimated that the average cost of producing the 1923-24 crop was about 23 cents per pound. Data on the cost of producing cotton in Argentina is very difficult to obtain. Reliable data can not be had, but the best information that can be obtained indicates that the 1924 Argentine cotton crop probably did not cost more than 10.5 to 12 cents per pound. Land in Argentina is much cheaper than in the United States. In the Territory of Chaco, which is the center of cotton production, a very large portion of the land belongs to the National Government and is being sold to settlers in tracts of not more than 250 acres to each settler. The price ranges from $6.50 to $12.00 per acre, and payments may be made in six annual installments which begin within one year after the settler's land has been surveyed by the Government engineer.

Mules and horses in the cotton zone sell for about $24 to $32 per head. They are very small animals and probably it will require two or two and a half Chaco mules to do the work of one good average farm mule in the United States. The Argentine cotton producers, however, do not spend much money on feed for their work animals. It is probable that the item of work animals on Argentine cotton farms is considerably less expensive than in the United States.

Farm wages in the Argentine cotton section average considerably lower than in the United States. Day workers in the Chaco now get about $1.50 per day for rough labor to $2.00 and $2.40 for labor requiring persons with some mechanical skill. In the Provinces of Corrientes and Santiago del Estero, however, the average wages for day laborers is less than half the price in the Chaco. Twelve dollars per month is good monthly wages for men in many places in Corrientes and women work at hoeing, etc., for $6.00 to $9.00 per month. During the past harvest the average price of picking was about $1.50 to $2.00 per hundred pounds in the Chaco, while less than half that price was paid in most of the other cotton producing sections.

Climate and rainfall are favorable for cotton over a very large part of the North of Argentina. Large sections of the West of the Republic are too dry for rain grown cotton but much of the land in the dry zone can be easily irrigated from streams which descend from the Andes. With irrigation, almost all the land of the irrigated zones is good for cotton. The average yield of cotton in the

irrigated sections is probably about 300 pounds of fiber per acre. The average yield of the 1923-24 crop for the whole cotton zone was about 142 pounds of lint per acre. There was not much cotton cultivation outside of the Chaco in 1923-24, so the yield of 142 pounds per acre may be accepted as approximately the average for the Chaco.

It is believed the per acre yield can be increased when the population have had more experience in cultivating cotton. Almost all farmers now plant only about one-third as much seed as they should. The majority of Argentine cotton fields do not have a good stand of plants. Many mistakes are also made in the cultivating operations. Entirely too much hand labor is performed at great loss of time and at great expense to the farmer. The writer has seen one farmer hoeing cotton which was thickly grown up with weeds in middles and rows. The cotton was about six to eight inches high. The soil had not been cultivated in any form since planting. The weather was very dry and the moisture was rapidly escaping from the land. The farmer had several good cultivators under his implement shed. Despite this, however, he was paying two pesos per man per day to cut out all the weeds in row and middle with hoes. It was requiring five men to hoe one hectarea a day. He then was obliged to follow with the cultivator. This one operation of hoeing was costing ten pesos per hectarea plus the cost of cultivating behind the hoe at about two pesos per hectarea, which made twelve pesos per hectarea. Had he reversed the order and cultivated before hoeing he could doubtless have accomplished even better results at not more than four pesos per hectarea. Many other examples could be cited which indicate opportunities to reduce production costs. Also farmers do not understand the method of using insect poisons nor do they appreciate the necessity of combating insects when they first appear.

Unfavorable Factors.

Many Argentine farmers failed with their cotton experiments during the last two years. A large part of the failures were due to drought and leaf-worm. Most all the losses to drought could have been avoided by proper dry-farming methods. Losses to leaf-worm could have been avoided by the efficient use of Paris Green. It may be said therefore that a large proportion of the cotton failures can be charged directly to lack of experience in cultivating cotton, and that as experience is gained these failures will be greatly reduced.

All of the above would lead one to believe that cotton production in Argentia should rapidly increase despite a probable material lowering of prices. But Argentine cotton farmers have to face the terrible grasshopper plague. One is never sure his cotton will not be destroyed by the grass-hopper. Grass-hoppers usually go southward during the months of August to November or December and they return northward in January to March. During either journey they descend at times and devour all green plant life. Often cotton farmers lose everything to the grass-hoppers. Should they happen to visit the same sections two or three years in succession farmers are ruined. It is fortunate, however, that they do not always travel the same routes. Cereals and corn have become very important crops despite the fact that the grass-hopper used to be as bad in the cereals zone as they now are in the cotton zone. As more land has been devoted to agriculture, especially with the gradual pushing of Agriculture further to the North the grass-hopper damage has diminished in the South. Should the experience of the South be indicative of what may be expected in the North it is to be hoped that with the agricultural development of the North will occur the gradual decrease of grasshopper damage.

Other handicaps which confront the Argentine cotton producers are the mixed varieties of cotton grown, lack of adequate transportation to market, a poor quality of ginning, and a very inefficient marketing system. The cotton produced in all parts of Argentina is badly mixed. Not only is there a great lack of uniformity in staple length but all other characteristics vary greatly.

Ginners usually do not appreciate the effect that the class of work of the gins has on the value of the fiber. Gins are operated at too high speed. Saws are not properly filed. Machines are operated with broken saws. Mote boards are not kept adjusted. Brushes often do not function properly. Wet cotton is sometimes fed into the gins. All these cause about every gin defect that is known. Also very few gins have and operate cleaning devices. The mixed varieties and the bad ginning both materially reduce the value of the cotton. Because there are not enough railroads in the cotton zone many farmers are long distances from railway stations or local markets and they are obliged to either pay dearly to get their cotton to the railway or to sell at a very low price.

The Argentine cotton marketing system is very expensive. Practically all producers sell seed cotton. Ginners buy cotton, sometimes for their own account and sometimes for the account of others. It is only natural that average low prices are paid to producers. Cotton is picked into small jute sacks similar to the tow sack used for grain in the United States. These sacks cost fifteen pesos or about $6.30 for the number necessary to sack one ton of cotton. Because the cotton is sacked much extra labor is needed when it is necessary to unsack the cotton to dry it and then resack it.

When the small sacks of cotton arrive at the gin they are removed from the two wheel wagons and weighed, a few sacks at a time, on small scales. They are then carried on the shoulders of men into the gin house where the sacks are cut open. The tightly packed cotton is pulled out by hand. Then it is handled with forks to make it fluffy and finally it is fed from the floor of the gin into the automatic suction elevator, if there happens to be one. This all added to the purchase price of the sacks probably costs the farmer about twenty-two pesos or nine dollars per ton, merely for the unnecessary practice of sacking the cotton. The seeds are sacked as they come from the gin. Each gin employs two or more men who do nothing but sack the seed. This adds another unnecessary item of expense to the present Argentine method of marketing cotton.

Much of the Argentine cotton is shipped long distances to gins. There is a tendency to consider a gin a factory, and to build gins in commercial centers and to require farmers to haul their seed cotton long distances to the gin. Gins employ ten to forty persons to operate them. Eighteen persons were the average employed by all the gins of Argentina in 1924, despite the fact that probably one-third of the establishments had only one stand of forty, sixty, or eighty saws and hand press. Large quantities of seed cotton is shipped each year for long distances, sometimes hundreds of miles by train to the gins.

A rather large percentage of the cotton bales of Argentina are loosely packed. And there is little encourage-

ment for packing better, because the railways do not appreciate the difference in the value of seed cotton and lint cotton and in many instances the freight rates are very high.

There are probably other factors which are unfavorable to Argentine cotton development, but the reader will gather from the foregoing that most of the difficulties are of such nature that they could be rather easily remedied if the Argentine cotton producers seriously undertake to correct them.

Argentina May Continue Growing Cotton.

It is possible therefore that Argentina may continue to grow cotton. It will be a very long time before Argentina will rank high as one of the world's important cotton producers, but cotton may become one of the important crops, with relation to other crops in Argentina, within the relatively near future. Much interest is now shown in cotton. The acreage has increased from about 50,000 acres to about 250,000 acres within two years. By improving their cultural methods and by increasing the efficiency of their harvesting, ginning and marketing methods cotton production will be very profitable in Argentina. These are receiving the attention of private persons and of the Government. Two North American cotton experts are now in the country in the employ of the Argentine Ministry of Agriculture and other branches of the Ministry of Agriculture are giving attention to cotton development. Great efforts are being put forth to improve both the efficiency of the cultural and of the marketing methods.

Another reason why Argentina may continue to grow cotton is the fact that in the vast Northern, undeveloped regions of the Republic where are to be found the best opportunities for settlers, cotton is the most suitable of all crops. The government and many private companies are putting forth great efforts to colonize this zone. The efforts are causing certain sections of the zone to become populated very rapidly. Cotton grows better than any other crop and as soon as better marketing methods are adopted cotton should pay very good profits. It is not unlikely therefore, that before long Argentina will have a fairly firmly established cotton industry and that then the production of cotton in Argentina will gradually and rather rapidly increase in importance until it will be one of the most important crops of the country.

What the Southern Mills are Doing

Somerset Mills, Inc., Roxboro, N. C., have been organized, and a plant to contain about 100 looms will be constructed. The mill will be affiliated with John Watt's Sons Co., of Philadelphia, manufacturers of Turkish towels. Officers elected are: James H. Craig, Philadelphia, president; J. A. Long, of Roxboro, vice-president; A. C. Harris, of Roxboro, secretary and treasurer. W. H. Kinkhead, from Philadelphia, will be superintendent in charge of the plant. Contracts for the building call for a structure 100 x150 feet, with a number of operatives' houses, as the initial construction work. The capitalization is $50,000.

An extensive program of research work has been instituted by the Proximity Manufacturing Company, Greensboro, N. C. Under capable direction, experimental and research activity, as well as testing work, will be carried on as a service to the mills of the company.

Gibson Manufacturing Company, Concord, N. C., have doubled their output on rayon silk novelties, and have secured several Atwood silk spoolers through H. L. McCall, southern representative, Atwood Machine Co., Charlotte, N. C.

It is reported that the Hillcrest Silk Mills, of West New York, N. J., will remove its plant to High Point, N. C. The equipment will include 290 box looms and 10 plain looms for the production of sport satins, crepe de chine, etc. D. Bunker is president of the company.

Report from Lexington, N. C., is to the effect that a lace mill is planned by R. P. Earnhardt, of the Wabena Mills, and associates. The manufacture of cluny, torchon, etc., is under consideration.

A new dyeing and finishing plant will be established at Burlington, N. C., by the Southern Dyeing Company, to specialize in work from the local hosiery mills. The new company is headed by E. W. Sweet, president, and W. L. B. Garrison, secretary-treasurer, of the Southern Artsilk & Dye Works, established at Burlington about a year ago.

Carl Stone Mills, Inc., Charlotte, N. C., will, it is reported add from 50 to 100 looms, several Universal winders, and a number of Atwood rayon silk spoolers.

The mill to be built by the Columbus (N. C.) Cotton Mills will be 150x60 feet with a warehouse 100x50 feet, and 12 homes for operatives. G. J. Nord, of Gastonia, N. C., is the engineer in charge.

Waldensian Weavers, Valdese, N. C., have placed order for a number of Atwood silk spoolers, through H. L. McCall, Charlotte, N. C.

J. E. Sirrine & Company, of Greenville, S. C., have prepared plans for an 80-foot addition to the textile building of the North Carolina State College, Raleigh, N. C. The contract has been awarded to Gallivan & Company, of Greenville, S. C. When completed the building will be 75x230 feet, three stories high. A complete heating, lighting and sprinkler system will be installed in the entire building. There will be $100,000 expended on enlarging the building and purchasing additional equipment. The new building will contain an experimental department which will be operated as a separate unit. In connection with this experimental department, a research laboratory will be maintained containing all the necessary apparatus for the testing of raw materials, yarns and fabrics, and this department will devote its entire time to a systematic study of problems confronting the textile industry.

The W. S. F. Textile Club, whose membership includes the overseers of the Woodside, Simpsonville and Fountain Inn plants of the Woodside Mills Company in South Carolina, has been organized. The officers are: B. W. Ramey, Woodside Division, Greenville, S. C., president; W. J. Culberson, Fountain Inn, S. C., vice-president; H. W. Abbott, Simpsonville, S. C., secretary-treasurer. A course of study on textile problems has been arranged. The club will meet on the second Tuesday of each month, and the members, at the separate plants, will meet every two weeks. Results of the discussions of the club will be disseminated throughout the membership, and in that manner the handling of problems facilitated. The executive officers of the mill are honorary members of the club. A similar club has also

been formed at the Easley (S. C.) group of the Woodside organization, and the following are the present officers: A. E. Smith, of Easley, president; P. A. Kay, of Liberty No. 2, vice-president; and D. J. Crowe, Liberty No. 3, secretary-treasurer.

Contract has been let for the immediate construction of 50 additional homes for operatives at the Joanna Mills, Goldville, S. C., and when these are completed the plant will be operated day and night, it is announced.

Beaumont Manufacturing Company, Spartanburg, S. C., is installing a number of new spinning frames furnished by the Whitin Machine Works, Whitinsville, Mass.

Contract for the erection of the additions to the Riverside & Toxaway Mills, Anderson, S. C., have been awarded to T. C. Thompson and Bros., Charlotte, N. C. The Toxaway mill will be two stories, 107 x 275 feet, and the addition to the Riverside plant will be three stories, 50 x 60 feet.

In honor of J. Eugene Elliott, recently appointed assistant treasurer of The Trion Company, Trion, Ga., and Mrs. Elliott, a banquet was held on Saturday night, December 5th, at the Trion Y. M. C. A., attended by the department heads of the mill and the local ministers. After an excellent dinner, Mr. Elliott was introduced by the toastmaster, Carl P. Thompson, superintendent of The Trion Company, and made a beneficial address, in which he presented a series of interesting thoughts on vital matters affecting the welfare of the employees and the company. He dwelt particularly upon the relation of the employee to each department, and vice versa, charting the responsibilities that lie ahead of each employee, and indicating clearly the lines along which the activities of all might be directed to the best interest of the town and community.

Several Atlanta men have purchased the controlling stock of the Crawford (Ga.) Cotton Mills. The new officers are: President, Vaughn Nixon; vice-president, J. R. Tibbetts; secretary, H. H. Bennett; treasurer, Richard W. Courts, Jr.; and manager, William D. Ellis. Callaway Mills, Inc., of New York, have been appointed as selling agents and the mill will continue to manufacture canton flannels. Practically no changes will be made either in the personnel or in the equipment of the mills, it is announced.

Plans for a new No. 6 Mill, and an increase in capital stock from $500,000 to $1,250,000, have been announced by the Muscogee Manufacturing Company, Columbus, Ga. The new mill will be in the nature of an addition to the present No. 5 mill, and will be in the shape of an L, 193 feet long by 115 feet wide, five stories high, and 108 feet wide by 54 feet long, five stories high. The buildings are to be of reinforced concrete and steel and brick construction, with steel sash. In addition to this building program there will be a complete reorganization of all of the machinery layout in the existing plant, and it is understood that additional looms and other machinery will be installed. Robert & Company, Atlanta, Ga., are the engineers and architects.

Willingham Cotton Mills, Macon, Ga., will erect a community house in which the social activities of the village will be centered, it is announced.

A new cloth room, 70 x 44 feet, will be built by the Harmony Grove Mills, Commerce, Ga. Robert & Company are the engineers.

A new slasher room will be built at the Palmetto Cotton Mills, Palmetto, Ga., Robert & Company being the engineers and architects.

An additional plant of 7,000 spindles will be built immediately by the Dixie Mercerizing Company, Chattanooga, Tenn. The new building will be two stories high, 150 x 100 feet. Also, 25 new houses will be erected. Robert & Company, Atlanta, are the architects.

The New England Mill Situation.

Dividend returns to stockholders of Fall River mills for the last quarter were the lowest average reported for the past twelve or more years and probably mark the low point of the prolonged depression that has affected that center for two years or more. Counting now upon cotton that will be priced more in harmony with the prices secured for other textile fibers, and supplied in greater abundance than has been true for some years, the mills are resuming operations more generally and have bought cotton more freely. At the present time the output is around 70 per cent capacity under a 48-hour law.

Mills elsewhere in New England are generally doing better in the volume of output and in orders in hand. Many of them have swung over to rayon mixtures and are not producing any large volume of staples. The fine combed goods mills are doing much better than mills engaged on carded yarns and those running on fancies are supplied with orders that will generally carry through the winter.

The finishing plants not engaged on rayon in some form are not well employed in the jobbing division, but the large corporation printers are still running substantially in full and are selling a wide variety of high priced and highly styled materials. The job printers are running barely 60 per cent capacity but they have a large volume of engraving in hand and expect to become very busy in the immediate future as few converters have done more than sample various lines. They have provided themselves with gray goods quite freely in some instances and are withholding printing and finishing orders until they can foresee what the trend of styles and colorings will be. In a number of instances special gray cloths have been provided, but some converters have many fine voiles, broadcloths and other popular cloths coming from the looms, and will give printing or finishing orders in the near future.

Mill machinery plants have some export business in hand and some are busy on special rayon machinery in warping and spooling. They are looking forward to a better business for the coming year and some have already begun to feel the influence of added plans for expansion in the South. While no very important New England business has been developed the impression prevails that if cotton remains priced at 20 cents or under it will not be many months before several New England renovating plans of importance will be undertaken.

New England is buzzing with reports of large power developments that will completely change many manufacturing methods not already affected by changes undertaken as a consequence of local electrical power developments. The territory is within reach of the greatest power possibilities in the country, including Niagara Falls, northeastern Canada, Maine, and some other less potential sources of water supply. Several things are impelling action now, the most important being the cost of coal, and the need for diversi-

MATHIESON Chemicals

Quality Is Paramount

WITH many of the raw materials going into the chemical-consuming industries, market fluctuations are wide and frequent. In such cases the question of price may readily assume in the mind of the buyer an importance out of all proportion to other vital considerations.

This undue emphasis on price may often extend even to those raw materials where market changes are infrequent and small, and where little may be gained by "shopping" for lower quotations. Thus, when the quality and uniformity of the product and the character of the manufacturer should be the prime considerations, price frequently becomes the principal deciding factor. Long-established brand names and records of service may be entirely disregarded for a negligible difference in price.

By rigidly adhering over many years to a uniformly high standard of manufacture, we have built up for our "Eagle Thistle" Brand products an enviable record for quality and uniformity, at the same time establishing a reputation for satisfactory service and equitable business dealings with the consumer. We believe that discriminating buyers are recognizing more than ever before that these are the first things to be considered in selecting a source of supply.

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fying the output by the use of smaller units in large plants than are possible, economically, under steam power.

Another matter that has aroused a strong and united New England sentiment among cotton manufacturers is the threat that higher rates of transportation will be imposed on carload or smaller than carload cloth shipments, as an outgrowth of an appeal made concerning the cost of shipping tire fabric west. The suggestions that have come of higher rates for this section would cost a plant like the Amoskeag Company alone an increased handicap of $60,000 a year, to say nothing of the costs that would be added to those borne by customers of the mills in the West and South. The railroad situation has begun to clear a little through the permission granted to the N. Y., N. H. & H. R.R., to operate again the lines of surface electric railways along its route and to operate busses and trucking lines as feeders for the main lines of rails.

Protests against discrimination have already been made to the Inter-State commission authorities and others in national positions, and hearings are shortly to begin on the whole question that has been opened up. But the most significant fact is that manufacturers and merchants have enlisted the united backing of all business men and political factors in the section in a movement that seems now to forecast a more vigorous industrial policy than New England has seen for many years.

As a side light on the changing political attitude toward textile industries in the section, it is pointed out that the citizens of Lowell and Fall River have been united in efforts to break down the extravagant political handling of political and business matters that have resulted in such large municipal taxes on mills rather than on all properties. Investigations made in Lowell disclosed the need of a thorough house-cleaning in the local political field, while at Fall River, a municipal election resulted in the beginning of what seems to promise a political overturn of large importance in the matter of taxation and other industrial matters there.

A noteworthy change has also occurred in the matter of labor in the mills and its control of backing by irresponsible unions. The Pepperell mills of Biddeford, Me., had made an agreement with some of its weavers to permit a try-out of what is called the unit system in loom operation designed to change methods of operation so that more looms may be attended by a single person. The plan or try-out had gotten underway when a strike occurred. The managers of the plant, instead of fighting piecemeal, brought the whole operative and mill situation to a focus by closing the plant of 6,000 looms.

The cause of the shut down seemed so trivial to business men and property owners in the city that they united at once in taking the side of the mill and requesting that operations be resumed and that the managers be given a fair opportunity to develop any economical methods thought necessary.

While the incident is only a straw showing how sentiment is changing it would hardly have been seen had it not come about in the past year that owners of mills, as well as owners of properties in mill towns, have grown tired of unfair baiting of mill managers and industries. It can hardly be inferred that this will lead up to a repeal of any of the repressive mill legislation already on the statute books of New England states but it has probably come to the point where restrictive legislation is not to be treated so lightly by the general public hereafter.

In nearly all cases where mills in cities and towns have appealed to the courts for abatement of taxes in recent years the mills have won. This was fully expected, as it was long known to be the fact that mills submitted to excessive valuations for taxation purposes for the sole purpose of avoiding troubles that would make local property owners dissatisfied or make it difficult to keep operatives contented with mill life. In the South this problem is met by the establishment of villages controlled largely by the mills and this used to be the case in New England. But appeals to the courts disclosed that laws bearing on taxation were more largely in favor of mills than the mills themselves anticipated until their lawyers had completed investigations. In any event, the end of excessive industrial municipal taxation of New England mills has undoubtedly been reached.

Trade has been improving moderately with the mills although the immediate business of the past few weeks was lighter than in the three preceding months. But on the whole, the mills have business in hand to keep them running about at present capacity throughout the winter provided nothing further of a favorable nature develops in the markets. Prices for standard goods are being readjusted to the lower cotton levels. Print cloths are easier, bleached cottons have been reduced from 1½ cent to 1 cent a yard, flannelettes are down from eight to 10 per cent, and other revisions are underway.

Prices on cotton blankets were not openly made by the large mills whose lines are now on the markets for the coming fall season. The reason is that trading conditions have prevailed, whereby some large operators were content to place their usual advance orders while others preferred to wait and would show no interest that would lead manufacturers to think that they were ready to place sizable advance mill orders. The trading thus far shows a downward revision of prices varying from 7½ to 12½ per cent under the prices of a year ago. But comparisons are difficult for the reason that many of the mills are making 25 per cent wool and 75 per cent cotton blankets on cotton mill looms and are doing a steadily increasing volume of trade on the new products. To meet this increasing sale the large producers of wool blankets have shown the best values seen in over 12 years, showing that competition is really on in these lines.

The Amoskeag Company named prices on wide flannelettes for the cutting up trades and will follow them with prices on narrow cloths about the first of the year. These prices averaged 8 to 10 per cent down from last season's openings. Larger quantities of closely woven napped goods are being bought for the sport and outdoor wear shirting trade, and for the goods that are being used largely in place of sweaters. These new lines have sold in increasing quantities and are quite different from ordinary napped flannels being napped short and snugly woven to break the force of the wind. They are wanted in place of wool flannels made for similar uses as they can be changed without risk of health, as in the case of dropping wool garments quickly.

The rayon development in New England continues to show great advances. More than two-thirds of the products of some of the large mills making bedspreads are of rayon mixture. Many beautiful rayon upholstery fabrics are being woven. Large yardages of plain rayons for dyeing and

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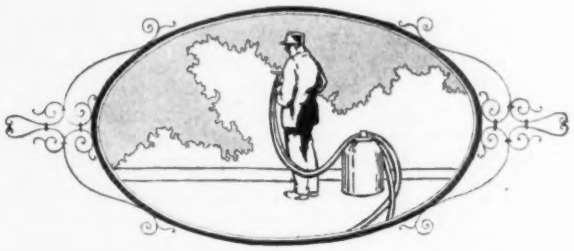

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A Review of the Year in Cotton.

BY H. AND B. BEER.

New Orleans, December 15th, 1925.

Having been mindful of the record acreage under cotton in the South this year—46,448,000 acres compared with 42,641,000 last year, we, in our special review of the cotton situation, as of September 9th, stated that chances favored a large crop.

At that time returns to the government pointed to a yield of only 13,740,000 bales, but we stated that in event of favorable weather during the remainder of the season, and if weevil were not destructive, final results might show the crop to be much larger than official returns indicated at that time. In which event we suggested using the New Orleans Cotton Futures Market for hedges.

Usually in the early fall we have been disposed to take a decided stand on the market and have expressed our opinions accordingly, but the crop outlook was so uncertain at that time of this year, and since prospects were for a much larger production, with the continuance of favorable weather, than government returns indicated in early September, we confined our comment to the advisability of hedging, rather than to advise buying.

In early September January contracts were around the 23 cents level, and middling spots were quoted around the same price—23 cents. Since that time the market declined to 17.90 for January and to 18.05 for middling, the market having declined to that level on October 31st; the lowest levels reached thus far this season.

Then came the rains and cold weather. The rains started during the last half of October and continued throughout the first half of November, being almost incessant and heavy, torrential in some districts, from Alabama westward, particularly in the Mississippi Valley, resulting in serious storm damage to cotton remaining open in the fields, which had the effect of causing the market to advance about 200 points, and the basis to harden materially for white cotton. It is conservatively estimated that at least 15 per cent of the total crop, or about 2,250,000 bales were made untenderable on contract by the bad weather.

Subsequently climatic conditions in the interior became more favorable, picking and ginning were resumed, and as much cotton that was thought would be lost was saved, crop estimates were raised, in consequence of which the market declined again.

The last and final government crop estimate of the season, released December 8th, indicated a yield of 15,603,000 bales of 500 pounds gross weight, exclusive of linters, compared with 13,628,000 bales exclusive of linters last season, which is the largest production on record, with the exception of the crop of 1914 when the crop was 15,906,000 bales without linters.

Present indications are also favorable for large cotton crops in most of the foreign cotton growing countries, perhaps by 1,500,000 to 2,000,000 bales more than last year, but the textile trade of the world has improved to such an extent that it will likely be in a position to care for this year's increased yield. Ever since 1921 the trade has virtually been on a famine basis as regards supplies of raw cotton, for while last year's moderate American crop and record crops elsewhere, improved the situation, it required this year's large crops to provide ample supplies.

WORLD'S CARRY-OVER, AUGUST 1ST, 1925.

Year	1925	1924	1923	1922	1921
American	2,880,000	2,319,000	2,573,000	4,904,000	9,364,000
All kinds	7,108,000	5,978,000	6,947,000	9,994,000	14,688,000

While the world's carry-over of American and of all kinds on August 1st this year was somewhat larger than last year and year before last, it was much smaller than it was in 1922 and only about one-half of what it was in 1921, whereas the price of middling is considerably lower for this time of the year than any year since 1921, ruling as follows: 19.16; 23.85; 34c; 25.50 and 16.75.

The season's prospective world's consumption of American cotton is about 15,500,000 bales including linters vs. 14,247,000 last season and 11,241,000 season before last, showing how rapidly the world is recovering from the effects of the world war.

Spinners takings of American cotton by the world this season are likely to be in excess of the prospective consumption, perhaps reaching 16,000,000 bales compared with 14,487,000 last season owing to good trade in the United States, on the Continent of Europe and in the Orient, and while trade is not so good in England, prospects are improving, and that country will probably take somewhat more than it took last season. This is the first time in years when mills of the world have been able to buy American cotton in quantity at so low a price; around 19 cents now for middling compared with last season's average price of 24.27 and 31.67 season before last which, in addition to good trade, is an incentive to stock up while the price is static.

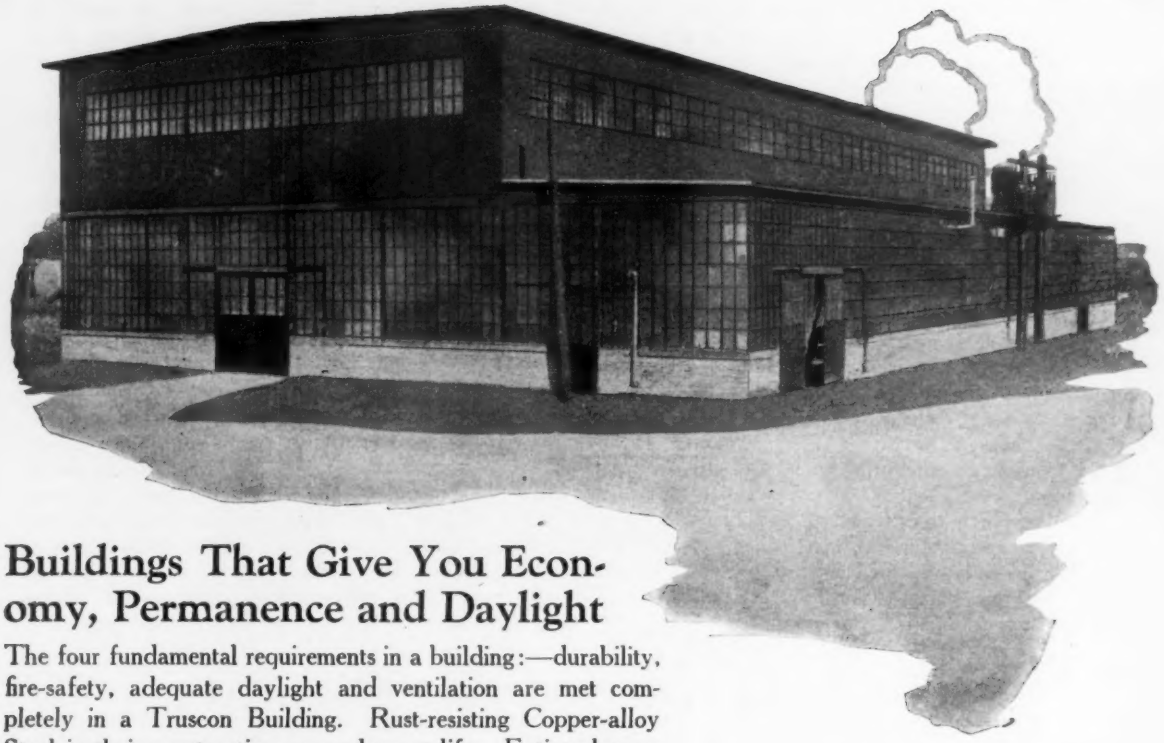
Aside of these features, such as the low price, increasing consumption, and the incentive for mills to build up a reserve supply, etc., there is the uncertainty of making another large crop next year. Results of the past two years have served to convince the trade that the large acreage and the dry, hot weather during the growing and maturing periods in the central and eastern portions of the belt made possible the making of good crops in the Mississippi Valley and South Atlantic States; the high temperatures and absence of rain during the summer and early fall having held the boll weevil in check the past two years.

There is no assurance of producing another large crop in the South next year because of the uncertainty of the weather and doings of the weevil, and, perhaps, a decrease in the acreage next spring since the present price of October, 1926, delivery is down to about the cost of production, near the 17 cents level, which means less for the interior. At this time last year October cotton was quoted at 23.13, hence the preparations at that time for a large, in fact a record, acreage, which was planted last spring, but prices are about 6 cents, or about $30 per bale lower this winter.

The following comparatives tend to denote that the season's supply, because of the indicated record consumption, and scarcity of white cotton, is not likely to be burdensome in the future. The deductions being based on the government's final crop estimate, plus linters, etc.:

SEASON'S INDICATED SUPPLY OF AMERICAN COTTON.

BALES	THIS SEASON	LAST SEASON
World's carry-over, August 1st	2,880,000	2,319,000
Indicated actual growth, including linters	16,695,000	14,808,000
Indicated season's supply	19,575,000	17,127,000
World's consumption of American	15,500,000	14,247,000
Indicated world's carry-over, July 31	4,075,000	2,880,000



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Cotton 1-26

As to the trade outlook for 1926, the situation is more than satisfactory. Business is active in almost every line and devoid of speculation and inflation, which is usually solid foundation to work on. While the cost of living remains high, the masses are well employed at high wages. Mills and factories are active, with a profitable business doing, which is attested by the end-of-year large dividend declarations, and conditions in the agricultural regions are good, particularly in the South where they were never better.

The political and economic situation abroad is improving rapidly as noted by the recent arrangements arrived at with the United States to put the gigantic war debts on a settlement basis, and the signing of the European Peace Security Pact, assuring lasting peace on the Continent of Europe and probably throughout the world, which will likely lead to the admission of Germany into the League of Nations early in the new year.

The American government and American financiers have done much to bring about the great change for the better in the old world, and now that they have the assurance of real peace in Europe, further large credits, perhaps on a more extensive scale, will probably be extended to foreign countries and foreign interests to help them to help themselves, although Europeans have accomplished much already of a constructive nature. There is much idle capital in America that will probably seek investment abroad, all of which will tend to further stimulate national and international trade.

In conclusion, we are now disposed to entertain a favorable opinion of the cotton situation, for while it is possible for the market to work somewhat lower, no further drastic decline is likely. Accordingly we favor buying, especially on depressions, October preferred because of its big discount, and uncertainty of making another large crop next year.

Surely the price, about 25 per cent lower than the average of last season's price, pretty well discounts a crop of about 13 per cent larger than the production of last year, particularly since consumption promises to be about 10 per cent larger than last season, especially since there is so much of low grade cotton in this year's crop, which reduces its spinning value to a considerable extent because of the wastage in spinning low grades. In other words, so far as good spinning cotton is concerned, there is probably not any more white cotton of character in this year's crop than there was in last year's smaller crop, and although the total crop is about 2,000,000 bales larger than one year ago, a large percentage of the increase is of inferior quality.

The Value of Accurate Records

BY LESLIE CHILDS.

Regardless of how much insurance an owner of cotton may carry on his stock in hand, it may avail him little if he does not comply in a substantial manner with the warranties in his policy. In particular does this apply to the keeping of books of record, for the breach of such a warranty will as a general rule void the policy, and in case of a loss the insured may find himself entirely unprotected, and unable to collect anything from the insurance company. The application of this rule is illustrated in a striking and interesting manner in the Mississippi case of Merchants' Union Insurance Co., Vs. Johnson, 99 So. 899, which arose under the following facts.

In this case the insured, it appears, was engaged in operating a cotton gin, and took out a fire insurance policy which covered cotton "ginned and unginned, baled and unbaled, seed cotton, cotton seed, including sacks or packages containing same, and bagging and ties," only while on the ginnery premises. This policy also contained a "record warranty," which provided as follows:

The Warranty.

"It is warranted that the assured will keep a book, containing a complete and correct record of all cotton put in the gin house or cotton house, and all cotton taken from the gin house, or cotton house, and all cotton seed put in the gin house or seed house, and all cotton seed taken from the gin house or seed house, and in case of loss or damage, the assured will produce such book and record for examination by this company, otherwise this entire policy shall be null and void."

While this policy was in force a loss occurred, and the insured sought to recover under the policy. The insurance company declined to pay for the reason, it claimed, the insured did not produce a record of his transactions as required by the provisions of the policy quoted heretofore. The insured therefore brought the instant action to compel payment.

Upon the trial of the case the insured attempted to show a compliance with the "record warranty" clause of the policy, and produced a book which showed the receipt and shipment of cotton, etc. However, it developed that this book had not been kept before the fire, and that it had been made up after the fire. The trial court thereupon ruled that such book did not comply with the record warranty.

The insured then attempted to show a compliance with the record warranty by other records he had kept such as the stubs of gin tickets, and bills of lading, and loose memoranda of weights, etc. All of these records were, it appears, incomplete and from them an accountant would not have been able to ascertain the amount of stock on hand at the time of the fire. But, despite this, the trial court permitted the case to go to the jury, and the trial resulted in a judgment for the insured. The insurance company appealed, and the higher court in stating the question before it, in part, said:

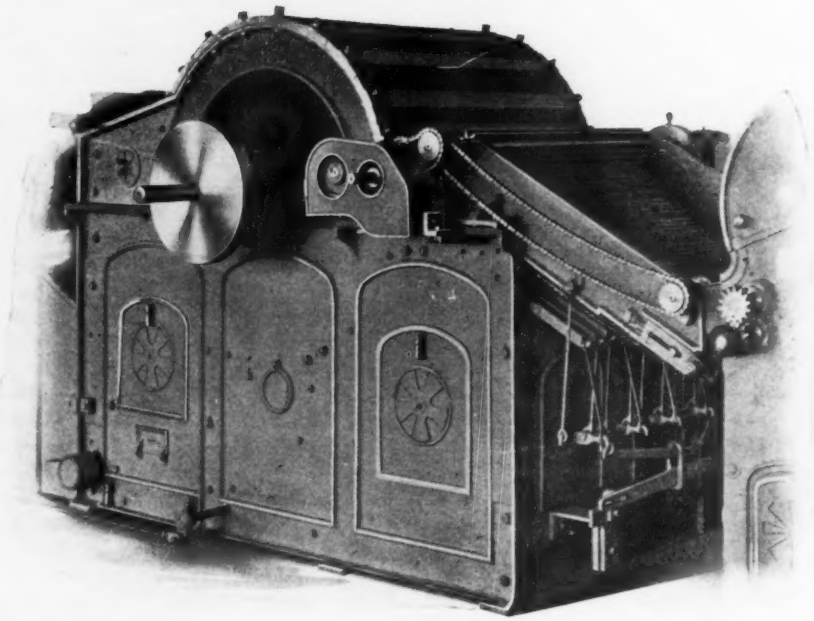
"In the case at bar the warranty only required the books to show the amount of the property on hand, but the requirement is that the record shall be complete and correct in this respect. No particular method of keeping the books is required thereby, but in order to comply therewith the book or books must themselves furnish the information with reasonable certainty without the aid of parol testimony or loose-leaf memoranda collected from other sources. * * *"

Following the above statement, the court directed its attention to a review of the record to determine whether or not the insured had complied with the warranty. In passing upon this question the court, among other things, said:

H. & B. AMERICAN MACHINE CO.

PAWTUCKET, R. I.

COTTON MACHINERY



"Buckley" Opener for Medium and Long Staple Cotton

This machine is essentially designed and built for the handling of long and medium staple cottons. The Cylinder is 41″ dia., and has Steel Blade Fingers arranged spirally across its entire width. The cover over the Cylinder is provided internally with a series of projections, which act upon the cotton after leaving the Feed Rolls. In the improved construction of this machine, the cotton passes over three-fourths of the circumference of this large Cylinder.

The front and lower portions of the Cylinder are surrounded by adjusting Grid Bars, which are so arranged as to form a gridded conducting channel for the cotton in its passage up to the first pair of Cages.

The front is provided with special Feed Rolls and Evener, with vertical Evener Box and horizontal cones. Ample room has been provided below the gridded surface for the accumulation of dirt, which can be easily removed through doors provided in the framing.

Southern Office: 814-816 Atlanta Trust Co. Building, Atlanta, Ga.

"It is unnecessary to here decide whether the stubs of the gin tickets, * * * would constitute a compliance with the record warranty if they contained a complete and correct record of the information required by the warranty. These stubs contain no record whatever of the amount of cotton or cotton seed sold, shipped, or removed from the gin plant, and in this respect they totally fail to meet the requirements of the warranty. From these stubs it would be entirely impossible for an accountant to ascertain, with any degree of accuracy, the amount of cotton or cotton seed on hand at the time of the fire.

"In so far as the cotton seed was concerned, the appellee (insured) attempted to supply this deficiency by introducing certain railroad bills of lading, and certain loose memoranda of weights which purported to have been issued by a cotton seed oil mill * * *. This loose memoranda was not admissible as a substitute for the book required by the warranty to be kept. * * * We are of the opinion that the appellee failed to show a compliance with the record warranty contained in the policy * * *."

In conclusion the court reversed the judgment rendered by the trial court in favor of the insured, and ordered judgment for the defendant, insurance company. Holding, as outlined in the opinion, that the records kept by the insured did not comply with the record warranty, and that by the very terms of the policy it became null and void for this reason.

The foregoing Mississippi case illustrates in a striking manner the importance to an insured of complying in a substantial manner with a record warranty where such appears in an insurance policy. In other words, such warranties should be taken seriously and books kept that will comply with their terms, and certainly an insured should not depend upon any haphazard method of keeping account of his stock in cases of this kind. For, as in the case reviewed, if the method of keeping accounts fairly fails to comply with a record warranty, the insured may find his policy but a "scrap of paper" when he attempts to enforce it after a loss.

Are You Worth So Much?

Two of the chief officers in a big business organization, whose owner spent most of his time traveling, came to the conclusion that they were indispensable.

"The boss has a pretty easy time of it," they said. "He stays away for months, but we have to be on the job every day. All he does when he returns from a trip is to stir things up and make more work for us. We ought to control this business ourselves."

One time they announced, with what they thought was bombshell effect, that if the business wasn't turned over to them at their price, they'd start a competing organization.

Probably they were never more surprised than when their employer with surface calmness accepted their resignation. They carried out their threat, became competitors, and in a few years lost their own savings and the savings of their friends who had invested with them.

Their former employer promoted some of the assistants and, after watching the organization for a short time to see that it was running smoothly, resumed his traveling.

Although he seemed to be little better than a loafer, he knew the business thoroughly. His ideas were the ones responsible for its growth and success.

The mistake his men made was that, because his orders came to them in the form of suggestions instead of in the form of commands, he had no vital interest in the company's affairs and played no important part.

It is astonishing how many employees, otherwise gifted with common sense and even brilliance, will make mistakes like that.

Joseph Pulitzer, who as everyone knows was responsible for making the New York World a success, had a similar experience with George W. Turner, who became his business manager. One time Turner went so far as to make a flat demand for a controlling share. He not only failed to get any share, but he lost his job. His loss meant almost nothing to the *World*. Instead of proving conclusive that Mr. Pulitzer had made a mistake, Turner drifted from job to job and eventually became a teacher of English in Japan.

Blessed is that man who knows his true worth and has sense enough not to exaggerate his own importance.—(*From September, 1925, issue, Lockwood, Greene & Co.'s "Engineer."*)

Paul Edlich, M. E., Delawanna, N. J., is representative for an interesting type of cloth drying machinery which involves the step-drying principle. That is, the cloth, when it is introduced into the machine and is in the wettest condition, comes in contact with the hottest air, and the temperature is decreased through the process in proportion to the dampness of the cloth, the driest cloth being finally dried with cold air and cool when leaving the machine.

One of these is the step-drying loop dryer, which is equipped with automatic feeding and delivery of the cloth, and is so arranged that it is constantly ventilated by a strong air circulation all along with the necessary displacement of waste air and supply of fresh air. The loop system is used, the cloth being transported by means of two endless chains, the links of which have short outriggers carrying the bars for holding the cloth. The bars form a closed lattice at a considerable distance over the chain. At the entrance and exit end of the machine, where the chain turns over, the lattice opens and presents a wide gap or increased space, it is pointed out. The bars remaining parallel to each other provide a large space, it is stated, which is sufficient for the cloth to form the loops and prevent improper folds. As stated, the temperature of the air drying the cloth as it approaches the exit is reduced in proportion to the dryness of the cloth.

A tentering and drying machine, involving the step-drying principle and especially adaptable to wool and rayon and other combinations, is included in the line. The step-drying principle, it is stated, is gaining recognition because of an economical steam consumption and the fact that it is designed to preserve the life of the color and insure the fabric against the dangers of over-drying.

An interesting little booklet, called "An Idea—And What Came of It," has been published by the Franklin Process Company. The brochure relates the experience of a well known New England textile mill in the use of various Franklin Process machines, describing how the adaptation of the machine was made to raw stock dyeing for this mill, outlining the designing problems encountered and how they were solved.

NOTES ABOUT MEN YOU KNOW OR KNOW ABOUT

J. N. BADGER, formerly superintendent of the Dunean Mills, at Greenville, S. C., has been made superintendent of the Appleton Mills, Anderson, S. C., which was formerly the Brogon Mills. E. P. Cofield, who has been superintendent of the Brogon Mills for a number of years, will assume a similar position at the Toxaway Mill in Anderson, it is understood.

P. H. HANES, JR., has been elected president of the P. H. Hanes Knitting Co., Winston-Salem, N. C., succeeding his late father.

R. H. SEYMOUR has resigned as overseer of dressing at the Griffin Manufacturing Company, Griffin, Ga., and J. D. Kilgore, overseer of weaving, has been made general overseer, with W. U. Gatlin in charge of dressing, spooling and warping.

HENRY D. MARTIN, until several months ago superintendent of the Griffin Manufacturing Company, Griffin, Ga., has been made superintendent of the Williamston Mills, Charleston, S. C.

C. A. JOHNSON has been made overseer of dyeing at the Roswell Mills, Inc., Roswell, Ga.

WARREN H. PEARMAN recently was promoted from general overseer of spinning, spooling, twisting and winding at the James White Cotton Mills, Princeton Plant, Athens, Ga., to the position of general overseer of the night shift.

JOHN T. HUNT, formerly of the Unity Spinning Mills, LaGrange, Ga., has accepted the position of superintendent at the new Boaz Cotton Mills, Boaz, Ala.

J. E. FIELDS, who some years ago was overseer of carding at the Exposition Cotton Mills, Atlanta, Ga., is now night overseer at the Rockford Mills, Rockford, Tenn.

P. B. MAYO, who for six years has been with the Parks-Cramer Company, and during the past three years assistant sales manager in charge of the southern territory, with headquarters in Charlotte, N. C., has resigned and entered business with C. M. Setzer, of Charlotte, selling boilers, pumps, filters, heaters, etc.

D. E. C. CLOUGH, formerly at Natchez, Miss., has resigned and accepted a position as overseer of carding at the Maginnis Cotton Mills, New Orleans, La.

W. C. MCADOO is in charge, as district sales manager, of the new district sales office of the Mathieson Alkali Works, which has been opened at Fairmont, W. Va. The territory to be handled by the new office includes nearly all of West Virginia, the southwestern section of Pennsylvania, and a number of cities located on the Ohio side of the Ohio River.

P. B. MITCHELL has resigned as superintendent of the Osage Manufacturing Company, Bessemer City, N. C., and A. F. Briggs has returned to that position.

A. A. MOORE, formerly superintendent of Hall's Hosiery Company, Statesville, N. C., has become superintendent of the Lillian Knitting Mills Company, Albemarle, N. C.

J. E. ELLIOTT, of Ware Shoals, S. C., has been made assistant treasurer of The Trion Company, Trion, Ga., with headquarters at Trion, succeeding C. P. Caperton, who has resigned and will enter the cotton business at Rome, Ga.

J. M. KELLEY has become superintendent of the Dothan Yarn and Cordage Company, Madrid, Ala.

J. L. NANNEY has been made overseer of the cloth room at Steele's Mill, Rockingham, N. C.

L. C. TURNER has become superintendent of the Summerville Cotton Mills, Summerville, Ga., which position has been held for a number of years by E. Montgomery, who has resigned.

C. V. JAMES has succeeded W. W. Gregg as superintendent of the Kindley Cotton Mills, Mount Pleasant, N. C.

W. E. TAYLOR is now overseer of weaving at the Saxapahaw Cotton Mills, Saxapahaw, N. C.

E. J. BROWN has become superintendent of the Love Knitting Company, Burlington, N. C., succeeding J. R. Milliken.

JOHN BRYANT has been made superintendent of the Georgia-Kincaid Mills No. 4, Griffin, Ga.

W. C. GUNTER has become superintendent of the Staley Mills, Staley, N. C., succeeding B. H. Sharpe, it is reported.

JESSE W. STRIBLING is in charge of the recently opened office of the Universal Winding Company, at 1326 Candler Building, Atlanta, Ga. The company announces that the Atlanta office was opened for taking care of the requirements of the trade in Tennessee, Georgia, Florida, Alabama, Mississippi, Louisiana and Texas. The original office at Charlotte, N. C., under Frederick Jackson, is still maintained for service in that territory. Mr. Stribling, who has been connected with the Dunean and other mills in the country, is considered an expert on winding questions.

W. W. SAYERS has been promoted to the newly-created position of chief engineer of the Link-Belt Company, with headquarters at 910 S. Michigan Ave., Chicago. He was formerly chief engineer of the Philadelphia plant of the company. Mr. Sayers has been associated with the company for 23 years. He was graduated from the University of Illinois in 1897. George L. Morehead, for the past six years attached to the management of the several Indianapolis plants of the company, has taken on the duties of manager of the Philadelphia plant. Mr. Morehead was graduated from the University of Missouri in 1902, and has been with the Link-Belt Company for the past 19 years.

WILLIAM J. WEED has been promoted to the position of assistant manager of sales of the Electro Bleaching Gas Company, 9 East 41st St., New York City. Mr. Weed has been a member of the Electro Bleaching Gas Company staff and their associate company, Niagara Alkali Company, for the past 13 years, having secured a broad general background which, it is stated, fittingly equips him for his new position, especially because of the six years which have been devoted almost entirely to the pulp and paper field, in which industry he is widely known.

American Association to Meet at Atlanta.

The 1926 convention of the American Cotton Manufacturers' Association will be held in Atlanta, Ga., on Tuesday and Wednesday, May 18th and 19th. This was voted by the Board of Government at a recent meeting in Greenville, S. C.

William J. Vereen, of Moultrie, Ga., is president of the association; Samuel F. Patterson, of Roanoke Rapids, N. C., is first vice-president; and Winston D. Adams, of Charlotte, N. C., is secretary-treasurer.

Allis-Chalmers Mfg. Company has opened a new district office in Lima, Peru, in charge of W. G. Bolton. This office, as well as the one at Oruro, Bolivia, in charge of P. G. Gilliard, is a branch of the company's office at Santiago, Chile, of which W. R. Judson is manager.

Recent installations of the Finnell system of electric floor scrubbing equipment have been made at the Valdese (N. C.) Mfg. Company, the Potomska Mills, New Bedford, Mass., three plants of the Klotz Throwing Company, the LaFayette Worsted Mills, Woonsocket, R. I., and the Forman & Clark Mfg. Co., Watervliet, N. Y.

WORLD DEVELOPMENTS IN THE COTTON INDUSTRY. By Louis Bader, M.C.S. 12 Chapters. Price, $3.00 per copy. New York University Press, Washington Square East, New York City, publishers.

This book treats of the world-growth of the cotton industry during the past twenty years giving especial reference to the cotton piece goods industry of the United States. This growth, having been so unusually rapid, has given rise to conditions that are having a tremendous effect upon the merchandising of cotton goods. The book outlines the resulting problems, and proposes their solution. Valuable statistical data on the industry in various countries of the world have been incorporated, and the study as a whole contains a store of useful and interesting information for those concerned with cotton manufacturing and distribution in all of its phases. The viewpoint adopted was made international, insofar as possible, since the manufacturing and marketing of cotton has itself become international in character. The book covers its subject thoroughly and comprehensively. Copies may be secured direct from the publishers, or through COTTON'S book department.

"A Bibliography of Bibliographies on Chemistry and Chemical Technology, 1900-1924," by Clarence J. West and D. D. Berolzeimer, has been published by the National Research Council, Washington, D. C., as their Bulletin No. 50. As the title indicates, the work is a compilation of bibliographies published as separates, or at the end of books or magazine articles, or as footnotes, on the numerous aspects of pure and applied chemistry. Each entry gives the name of the author or compiler, title, and place of publication. The majority of the entries state the number of references, thus giving an indication of the completeness of the particular bibliographies. The entries are classified under the proper subject-headings, alphabetically arranged, and a comprehensive cross-reference is used. There are approximately 2,400 subject headings, 7,500 author entries, and a total of 10,000 individual bibliographies. The price of the book is $2.50 per copy, and it may be secured through COTTON'S book department.

The National Aniline & Chemical Company have issued their "Dyers' Formulas" containing recipes prepared by the dye application laboratories of the company for dyeing cotton and wool yarn and silk and wool piece-goods to match the shades shown in the 1926 spring season shade card of The Textile Color Card Association of the United States, Inc.

Mills weaving rayon on looms using stop-motions have found difficulty resulting from breakage of the rayon yarn, if the drop wires are not smooth. The "New Process" drop wires of the Mossberg Pressed Steel Corp., Attleboro, Mass., it is claimed, have an especial smoothness, roundness and polish in the edges of the thread-eye which make them particularly adaptable for use with rayon. Further refinements in the patented process of manufacture are understood to be under way.

Through the courtesy of the Merrow Machine Co. the equipment of Merrow sewing machines at the Lowell Textile School has been completely replaced. The replaced equipment consisted of five machines of the following types: 60S, 60D, 60AD, 15F, 35FJ. The new machines have been selected with the day's needs in mind and include types 60S, 60Q, 60UD, 60WD, 35FJT. This new equipment gives a fine collection of overseaming and shell stitching machines with which to manufacture hosiery, underwear and outerwear. In addition to this new equipment the knitting department has three Singer and five Union Special sewing machines.

Gibbons G. Slaughter, Charlotte, N. C., has formed a connection, as southern agent, with a group of machinery manufacturers and chemical engineers who build and equip plants complete for manufacturing, processing and finishing rayon, including every stage from the raw pulp or cotton linters to the finished fabric. Mr. Slaughter announces that an expert on processing, dyeing, drying, sizing and finishing rayon and rayon and cotton mixtures is at his disposal for service. Among the concerns he represents are: Charles B. Johnson, Paterson, N. J.; Sipp Machine Co., Paterson, N. J.; Van Vlaanderen Machine Co., Paterson, N. J.; and Max Ams Chemical Engineering Co. Providence, R. I.

The Fidelity Machine Company of Philadelphia has taken over and will operate the Rhode Island Braiding Machine Company, of Providence, R. I. The braiding machine company and its personnel is being transferred to the Philadelphia plant of the Fidelity company. The Rhode Island Braiding Machine Company is a pioneer manufacturer, having been in operation since shortly after the Civil War, and manufactures high-grade braiding machines of all makes, including packing, tubing, wire covering, winding, and taping machines. The merger of these two organizations is of interest to the textile industry in view of the additional facilities which the Fidelity Machine Company can offer in their modern plant.

Model 101

The New High Speed
FOSTER WINDER
For Cones, Tubes, Cheeses, Cotton or Worsted

Note this comparison with older Models—

Average yarn winding speed per min.	400-600 yds.
Saving in H.P. per Lb. of Yarn	56%
Saving in Floor Space	59%
Saving in Investment	48%

These figures are from actual mill results and can be duplicated in any mill.

The Model 101 produces the same high standard knitting cone as the Model 30 Foster.

The Usual Foster Sturdy, Simple Construction

FOSTER MACHINE COMPANY

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U S Bobbins, Spools, Shuttles, Rolls, Twisters, etc., are recognized throughout the textile world as products of known quality. Their smooth operation and long, successful service has placed the products of many mills on the profit side of the ledger sheet.

Samples of any U S Product will be gladly sent—advice and assistance willingly given on any problem—drop us a line TODAY.

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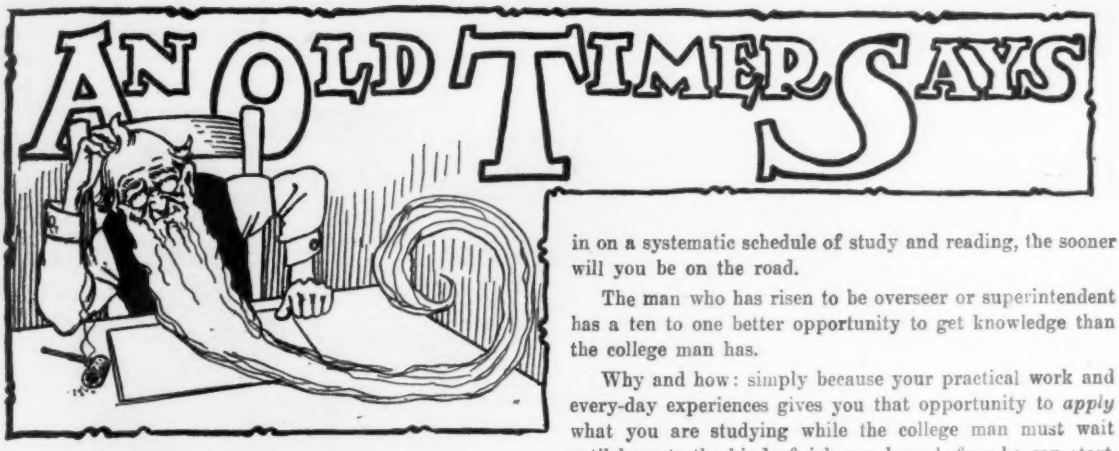

A Simple Secret.

I have told you what this secret is so many times, in so many different ways, that it seems to me every man who reads "Old Timer" should certainly know all about it by this time and be deriving some, yes, a great deal, of benefit by it.

Isn't it strange that a man who has enough brains and has proven himself somewhat above the average by being made an overseer or superintendent, I say isn't it strange that he has to be told over and over again the little secrets of success, of what it takes to get promotion?

You know an overseer's or superintendent's job is just telling people—weavers, fixers, spinners, section men, frame hands, etc.—over and over again how they must do and must not do certain things about their work.

But darned if those same overseers and superintendents can apply the same reasoning to *themselves*. I know some men, and you do, too, very efficient overseers and superintendents, that simply cannot be overseers and superintendents over themselves.

I have realized all my business life that "Human Nature" was a strange animal; but I simply cannot solve that problem.

Well, I guess if it were possible to get more overseers and superintendents to learn the "simple secret" there would not be so blamed many good jobs going a-begging.

One of the hardest problems for the head of any large corporation or firm is to find competent men. Isn't it simply outrageous to think of such a condition—but if you doubt it in the least, just start out and ask a few big men—men who are at the head of large corporations.

Yes, I know what you are saying right now—"Well, I would like to have one of those good jobs—let 'Old Timer' show me where it is." That's not the trouble at all, brother—there are thousands and thousands of men in the same boat with you—most all of us want one of those big jobs—

Then you probably ask—"Well, what are you driving at, anyway? Why don't I get one of them if they are running around loose like you say they are?"

The "simple secret" is that you have not prepared yourself for one—you have wasted enough time in the last four years to have gained more *knowledge* about your work than you could possibly have gained if you had been in college those four years.

Guess you don't believe that—well, it is certainly a fact just the same, and the sooner you realize that fact and start in on a systematic schedule of study and reading, the sooner will you be on the road.

The man who has risen to be overseer or superintendent has a ten to one better opportunity to get knowledge than the college man has.

Why and how: simply because your practical work and every-day experiences gives you that opportunity to *apply* what you are studying while the college man must wait until he gets the kind of job you have before he can start to apply *his* knowledge.

The "simple secret" is *knowledge—information*—know how to do it better than the other fellow.

I can well remember when I was in school how I did hate to study Latin.

I could not see to save my life how Latin would ever do me any good in the work I intended to follow.

I worried my father and my teacher until they let me drop it—I thought I sure had put one over on the teacher—but in later years I found out to my sorrow that I had put one over on myself.

Let me tell you one little instance: I was helping to install machinery in a mill during the Spanish-American war.

Well, newspapers were not so prolific back in those days as they are now (and nickels were not either) so at noon time we would all sit around together eating our lunch while one man would read the paper.

In reading about the war he came across the word submarine, and as none of us had ever heard the word before he turned to me and asked, "What kind of a vessel is a submarine?" (Now this may sound rather funny to some of you young fellows that know all about submarines, airships—gas engines—radios, etc., these days.)

"Search me," I replied—and he continued to read—meantime I was thinking about that word—"Submarine."

Finally I said, "Mr. Smith, 'sub' is a Latin word meaning 'under' and 'marine' is a Latin word meaning the 'sea'; then it must be a vessel which goes under the sea."

Well, they all gave me the horse laugh. How in the devil could a vessel go under water? How did I think the men could live, or did I figure they run the darn thing with fish, etc.

But a few days later Mr. Smith (our foreman) read another account of a battle that explained about the submarine going under the sea.

Then, by gum, I had the laugh on them. I think I felt bigger than Dewey.

And, incidentally, that little instance taught me a lesson—I got out my old school books and went down after it.

See what I am driving at, brother?

There never was a time in the history of the world when it was so true that—

"Knowledge is power."

Incompetence—failure to advance—not being ready for that big job when opportunity comes rushing upon you

Another Southern Mill *Ends Floor Troubles*

An important development in cotton mill construction, in the past few years, has been the general recognition of Creo-pine sub-flooring and timbers as a standard specification, by Textile Engineers, Architects, and Contractors.

These men, who are constantly searching for materials and methods that will make their work sturdier and lasting, have discovered these facts.

Creo-pine successfully withstands the ravages of dry-rot, which quickly destroys unprotected sub-flooring.

Creo-pine sub-flooring, installed once, eliminates floor troubles for all times.

Creo-pine has solved the most perplexing problem in cotton mill construction—rotting, sagging floors.

Your achitect or engineer has used Creo-pine. Ask his advice about its economy, either for new construction or replacement.

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before you know it—is all due—*all* I say, not part of it—but is *all* due to lack of information—lack of knowledge—and not lack of ability.

You have the *ability*—you have proven that to yourself and to others by getting to be an overseer or superintendent.

Tell me some way I can say it to you so dog-gone—dad-gummed—confounded hard that it will knock you down.

You have got the *ability;* but darn your lazy hide you will not improve it by obtaining the *knowledge* necessary to make you a big man.

That's not very nice writing I'll admit, and I suppose I am in for a good calling down from that bird COTTON calls its editor. (He has called me down so much I am getting accustomed to it.)

But a man has simply got to talk plain United States sometimes to get any results, and I have tried about every way I can think of to get you to wake up. But when you realize that the "simple secret" I am trying to tell you about is so *easy* to solve I know you will not blame me because you will feel like kicking yourself over the lot for not going down after that "knowledge" sooner.

Benjamin Franklin said: "The way to success is as plain as the way to market."

Study the lives of all the big men you know of and you will find that their success is due to the fact that they constantly acquired all the business knowledge that they could get their hands on—knowledge which enabled them to take advantage of *every* opportunity that came their way.

Don't you hold the job you now have on account of what you *know?* Sure you do! Well, just add the letters l—e—d—g—e to that word "know" and you have the "simple secret" of all your future success—your income—your happiness.

Success in any line of work comes to the man who knows *what* to do, *when* to do it, and *how* to do it and that takes "knowledge."

Success follows knowledge. I have never seen the human being yet who was smart enough to turn that statement around, in actual practice.

• • •

You know, it doesn't matter how hard anything is to do. If you will keep on doing it long enough it will get easy.

• • •

Look out! Here comes a hot one: There are not two per cent of the overseers and superintendents in all the mills of the United States who have not wasted enough time in ten years to have a diploma from any college in the country. Hold on, now, don't say I am a fool before you give the matter some thought.

• • •

An overseer said to me the other day, "'Old-Timer,' I sure am up against it. What am I doing to do?"

"What are you going to do? Hell, man, back your ears, grit your teeth, hold your temper, and give that "it" you speak of such a wallop between the eyes that you will wonder afterwards how easy it was done."

• • •

Ever thought of it: Anything *learned* can never be *unlearned.* That brain of yours is a wonderful thing if you will just give it a chance to show its stuff.

Cold Night Fires!

keep them away from your plant

COMPEL tramps and hangers-around to consider the safety of your buildings and inflammable yard materials: Put up a high, unclimbable Anchor Chain Link Fence.

Anchor Fences provide unfailing protection. They reduce fire risk, prevent theft, and permit more effective control of personnel.

For complete information — phone, write or wire our nearest office or sales agent. We are prepared to promptly erect fences in practically every section of the country.

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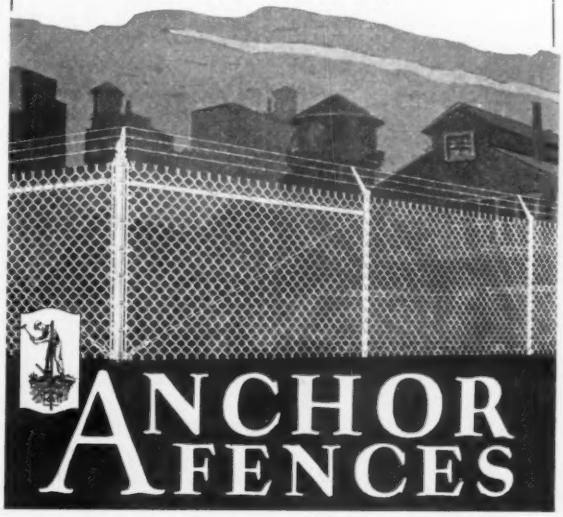

ANCHOR FENCES

Every Audit Should Be
A Detailed Audit

The leaders in practically every field of business now regard the ***Detailed Audit*** as an absolute necessity. The Reserve Cities Bankers Association, and most of the Credit Associations throughout the country, stand on record as preferring it to the Balance Sheet Audit.

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Stowe & Woodward Company
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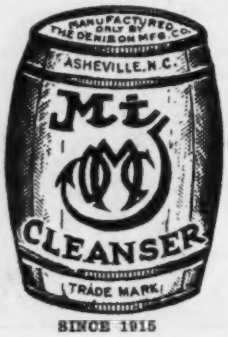

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Hundreds of Mills are enjoying cleaner floors at less cost—let us send you a sample of MI CLEANSER.

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HOW OTHER MEN MANAGE

Practical Discussions by Cotton's Readers On all varieties of Mill Subjects

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this dapartment unless so endorsed. This department is open to all.

The Question of Doublings.

EDITOR COTTON:

You have some very able contributors to the pages of COTTON, men who are good at asking questions and equally good at answering them. I feel after reading COTTON that there is always more to learn, and after all my years in the cotton industry I am still a student, looking for ways and means to better conditions, to make a better product and to get maximum production at the least cost considering equipment and working conditions.

If some of the able contributors to COTTON were told that too many doublings, as well as too few, would weaken the yarn, they would undoubtedly agree with me. But how many have experimented with more, or less, doublings so that the maximum strength of yarn would be obtained, and at the same time its appearance would be improved? What would they think if told that a method of doubling has been in use for nearly a year, with very gratifying results, a method out of the ordinary, arrived at after careful study and equally careful tests in order that an evener and stronger yarn could be made. In the first place our doublings totaled 1,024 for 30s and 40s yarn. For lower numbers the doublings were only 256. 40s and 30s were spun from 6 hank roving doubled. All yarns under 30s were made from single roving. The yarn was inferior in quality and strength, so much so that the spinning of 40s was discontinued for several months. Now there are more spindles on 40s than on any other number. 40s are made from 6 hank double, 30s from four hank single, and all under from 3 hank single. The quality of all our yarns is better and the average strength is over 10 per cent greater. The spinning never ran better and the production was never as high as it has been for the past eight months. The average production is between 97 and 98 per cent. So much for the introduction.

Please follow closely what was done to accomplish the results mentioned. We have only first and second drawing. The first doubles eight into one, the second, four into one. After going through the first drawing seven cans are run through again and one of these is run with three others through the second drawing. The sliver delivered by the first drawing is 65 grains made from a card sliver of 57 grains. Eight times 57 grains equal 456 grains fed into the first drawing, and 7 $\times$ 65 grains equals 455 grains, only one grain less, which makes the resulting sliver practically the same as before.

Has this ever been tried before? If not, try it or something better.

About travelers. When travelers fly off, work runs poorly and everything seems wrong. Send a ring to the traveler man, tell him your troubles and he will invariably fit a traveler to the ring that will suit. Hank clocks ought to be on all spinning frames even if the spinners and doffers are not paid by the hank. I believe that doffers, above all others, ought to be paid by the hank, but leave the overseer out.

J. J. (R. I.)

Some More Comber Questions.

EDITOR COTTON:

I have read with interest, in the last three issues of COTTON, the answers "Joe (Mass.)" has been receiving as to how to set the cushion plate on combers at both ends perfectly and still keep the angle. There don't seem to be many comber men who are willing to state just what they think. I want to say right here that our comber men who read COTTON will not say what they think because they have been getting away with something that can't be done. I guess "Joe (Mass.)" is satisfied by this time that he cannot get a perfect setting and still keep the angle, especially on a Whitin comber. If there is any comber man who claims he can get a perfect setting, I hope he will cut loose and let us in on his idea. Of course, if we build the comber over, maybe we can do it. Suppose the nipper stands that hold the nipper frame were in two sections, could we get a perfect setting? I for one think we could. Why is it that in setting No. 1 right we get a perfect setting and No. 8 is left the same? Because the nipper stand takes care of only one frame while the other takes care of both ends of the nipper frame, while if they were in two sections, we could set each head or delivery separate and get a perfect setting.

I would like to read more about combing, and I am pretty sure if the comber men will get together they will accomplish more through "How Other Men Manage" than they will by day-dreaming of their troubles. Maybe I can get some comber men to answer some questions, if they can't think of anything to write about. Here are the questions:

Do you have trouble getting the waste percentage?

Are the stop motions working all right?

Do the condensers give any trouble?

Do the brushes clean the half-laps, or do they carry bunches?

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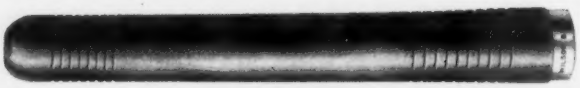
for the TEXTILE TRADE.



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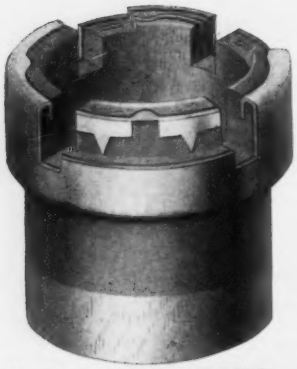

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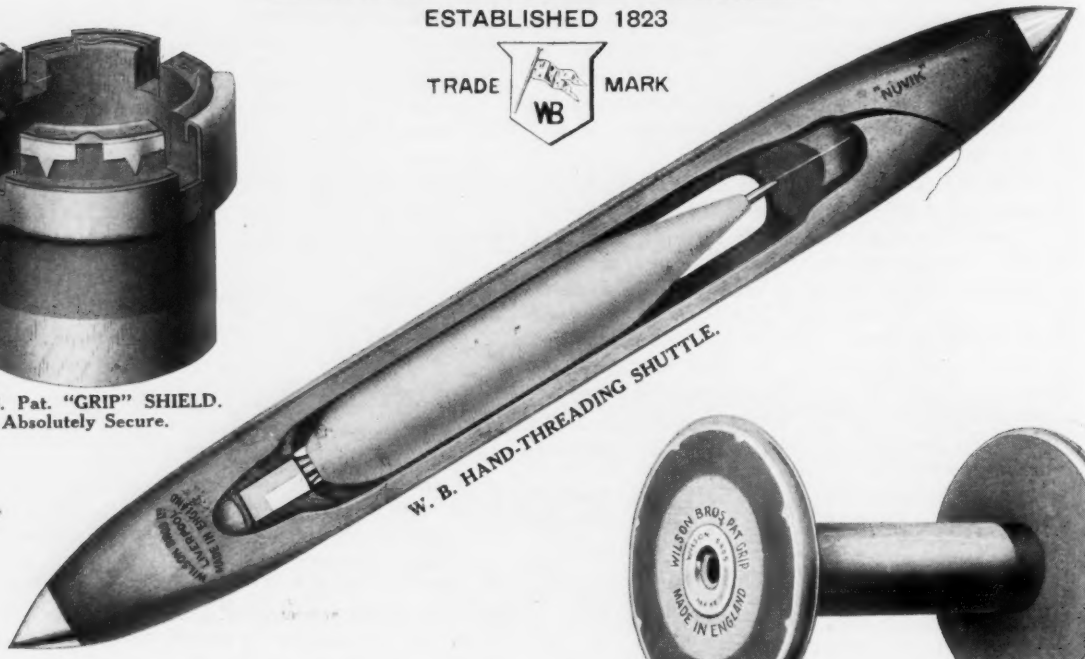

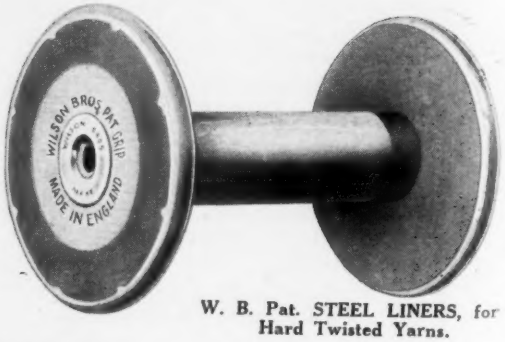

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Do you get a clean, even web?

Have you a stop motion to prevent the tail-end of the laps being drawn through to the half-laps?

How often are the combers re-set?

How often is it necessary to reverse the brushes and raise them? Why?

What is the most important part on a comber so far as getting good clean work is concerned?

N. C. M. (MASS.)

Making Core Yarn.

EDITOR COTTON:

In a previous article, discussing napping, reference was made to core yarn, and as "T. J. (Me.)" has asked for further information along this line, I will describe the process.

The modern method of making core yarn differs a great deal from "T. J.'s" system of making core yarn on a mule and is a very economical process. The jack roving is made on the card, and is twisted with a regular 30s/1 yarn on a special twister.

The card used is a woolen card, arranged either double or single, but the double card is by far the better, because the more even the jack roving, the more even the filling, in fact all the evening must be done at the card as there are no subsequent processes where this can be done. The front section of a wool card has what is known as a condenser, which splits the web up into, usually 72 ends and rolls them into rovings, which are wound onto spools, 18 ends to a spool. The condenser will be fully described later on, but for the benefit of any that are not familiar with wool cards, I will briefly describe them.

The licker is 18 inches in diameter and has nine garnet rolls set above it. The cylinder is 60 inches in diameter and carries 18 roller and clearer rolls above it, and the doffer is 30 inches in diameter. The working surface of the card is 55 inches wide. The card may be fed directly from the opened bales, but it is usually found better to run the cotton through a picker and then break the lap up, and throw the cotton into the card hopper. The card is fed by a Bramwell feeder, which evens the feed and presents the cotton to the feed rolls, which feed to the licker. As Chinese cotton is used mostly, and is very short of staple, flats cannot be used, and the rollers and clearers give much better carding. The cotton is struck off the doffer by a comb and allowed to fall on a cone shaped tin cylinder set parallel to the doffer. This rolls the cotton into a spiral sliver, which is pulled to the side by calender rolls. This sliver is run up over guide rolls and down onto an apron at the back of the front section of the card, which is set about four feet directly in front of the rear section. The sliver is laid on this apron in a diagonal position to the feed rolls by a traversing head which packs the ends close together and lays an even sheet to the feed rolls. By laying the ends in this way 40 doublings are possible, which enhances the evenness.

The front section is the same as the back until the cotton is struck off at the doffer. Here it is a very even sheet of cotton, which must be split up into 72 individual ends. This is done by the condenser, which is placed at the front of the card.

There is an old process of condensing, using ring doffers. The doffer clothing was put on in bands one inch wide, on a nine-inch doffer and two doffers were used, one over the other, with alternate bands set between the ones above or below. In this way the combs struck off the cotton in individual webs one inch wide, which were rolled into a roving, by rub rolls. This system is practically obsolete, being superseded by the tape condenser. The diagram shows how the tapes are placed on the rolls, see Fig. 1.

The rolls *A* and *B* are polished and have grooves just the depth of the leather tapes which run over them. The tapes are one inch wide, and on roll *B* the first tape runs at the end of the roll, while the second tape runs on roll *A*, one inch from the end. The third tape runs on roll *B* two inches in, and so on alternately for 72 tapes. There is one extra tape at each end, to take off any ragged edge, and this roving is later thrown back. From the diagram, Fig. 1, it will be seen that the web of cotton passing between rolls

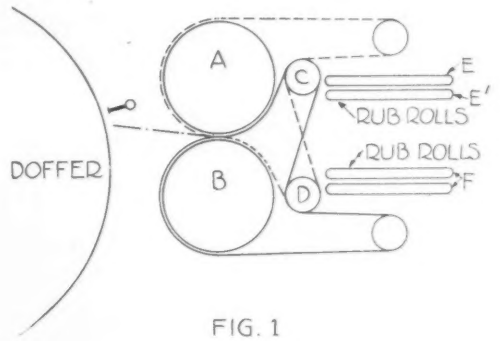

FIG. 1

A and *B* will be split by the tapes, the first tape taking one inch of the web along the polished surface of *A* and over the roll *C* to the rub rolls *E*. The tape being of leather, holds the cotton to it until it reaches a point near the bottom rub roll E_1 where it is transferred to the rub roll.

Figure 2 shows the two tapes separately, so that the course can be easily traced. There are two sets of rub rolls, which are really leather aprons with 15-inch surfaces, which travel in a forward motion, at the same time sliding

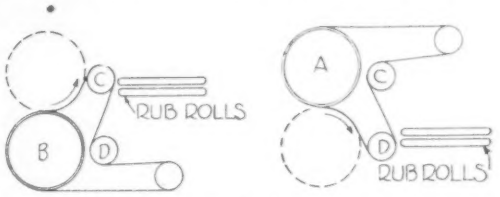

FIG. 2

sideways very rapidly, the top one *E*, Fig. 1, moving to the left, while E_1 is moving to the right. This side movement is only about one inch, but is very rapid, and thus rolls the ends and forms the jack roving, while it is being carried to the front. There are two sets of rub rolls and each set rolls 36 ends.

The spools that hold the roving are 50 inches long and the barrel is two inches in diameter. There are two spools for each set of rub rolls and they are driven by friction, from tin drums. The ends are wound on them and are built up by a traverse guide, which traverses slowly and winds 18 cheeses on each spool.

Fig. 3 shows how the spools look when full.

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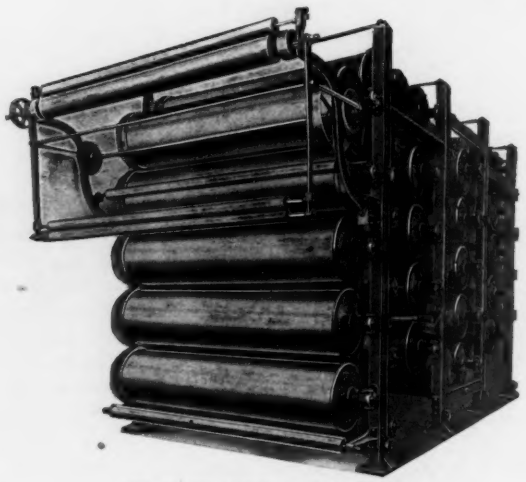

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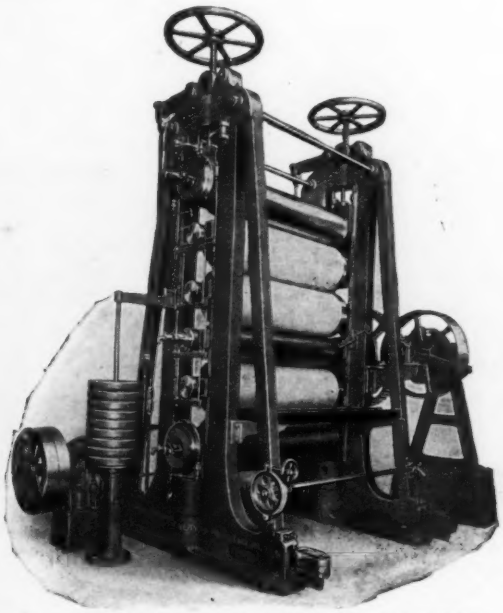

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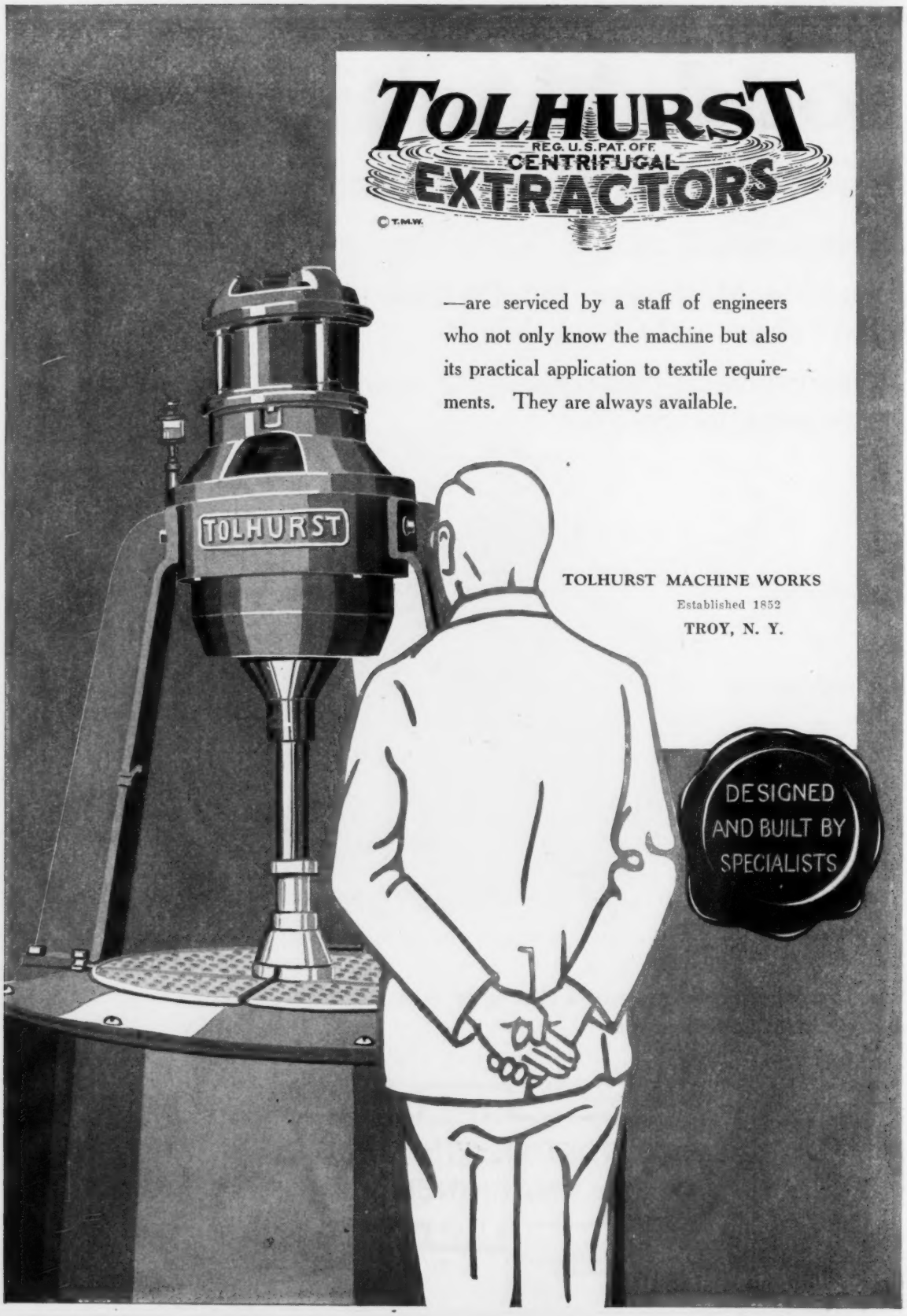
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The regular cotton cards could be used if the staple was long enough by adding a condenser at the front to split the web up into roving, and roll it. The cotton must be well carded, as neps or trash would show up in the yarn, and so double carding is necessary. This could be arranged in the card room by a few simple changes. Without a Bramwell feeder a very even picker lap would have to be used, as there is no doubling or drafting done in this system after the cotton leaves the card.

The roving from the card is very even and well carded and is made the desired weight, but has very little strength,

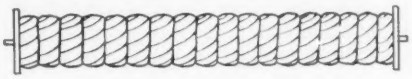

FIG.3

and as this is to be used for filling yarn, it must be given the needed strength. This is done by twisting the ends with an end of fine yarn spun through the regular process of yarn manufacture.

The twister is rigged with a drum instead of a creel, upon which is set the jack spool with the card roving. The rovings are brought down through a single roll with a weighted top roll. The fine core yarn is placed in a creel, under the jack spools, on cones, and the end brought through the single roll with the roving. The two pass down through a thread guide and traveler and are wound on a filling bobbin, the same as is done on the spinning frame. There is no draft on this machine, merely a twisting of the two ends.

The filling yarn thus produced is ideal for napping, as the heavy card roving is wound around the core yarn and stands out in position to be napped. The core yarn is not weakened by the napper and therefore a much stronger fabric is produced.

The cost of this system is very much less than with the old system of spinning a coarse yarn through the regular process. It is also much quicker, and makes less mix up of colors.

CONTRIBUTOR No. 262.

Points on Carding.

EDITOR COTTON:

While answering a question on licker-in speeds the other evening it occurred to me that a talk on carding practice in a general way might be welcomed by some of COTTON'S readers. Whenever I write an article for the discussion department I always endeavor, as far as I am able, to include a lot of information that will be of use to everyone.

The principal objects of a card are cleaning and combing of the fibers, the reduction of the lap to a sliver and the parallelization of the fibers. The combing out of the stock is accomplished by the teeth of the licker-in. Some other points where the cleaning and straightening of the fibers is accomplished are the grids and knives and between the cylinder and top flats. No cleaning or parallelization takes place from the licker-in to the cylinder or from the cylinder to the doffer. These are merely points where the stock is transferred.

The licker-in is commonly run at about 1,000 feet per minute or 425 r.p.m. This speed is considered to be good practice, and any variation does not show any advantages except possibly in some remote cases. The licker-in should be inspected at regular intervals to ascertain its condition. All bent teeth should be straightened whenever found. Personally, I do not recommend grinding the licker-in, although I am aware that it is done to quite an extent in some plants. The only persons who benefit from licker-in grinding are the manufacturers of the grinding machines. A dull licker-in should always be replaced as soon as possible or very "neppy" work will be produced. It is easy to make neps on a card, but impossible to get them out.

Some men are very much puzzled as to just why a licker-in wears more quickly on the edges than in the center. All kinds of reasons are advanced for this; however, there is only one legitimate explanation of this, and that is because the selvage of the lap is usually turned in slightly so as to produce a good, firm web.

The top flats are usually run from about 2½ to 4 inches per minute. They should be kept sharp to get best results, and must be kept clean.

The cylinder is usually run at about 160 to 175 r.p.m. A surface speed of about 2,500 feet per minute will give good results on practically all classes of work. It is very important that the cylinder be stripped often enough to keep it perfectly free from dirt. When the clothing is choked up the work produced is very dirty.

Some carders argue that the less stripping that is done the more even work can be made. If a man is onto the job he does not have to cut down on the number of strippings to keep his work even. He must simply instruct the strippers that they must allow enough time after stripping for the sliver to get back to pretty nearly the normal weight (*and see that they do it*). This usually takes from three to four minutes, depending entirely upon the speed of the doffer. The card produces the best work just after stripping, so it is logical to assume that reducing the number of strippings to produce even work brings us face to face with another evil: dirty work. Of course if very clean work is not essential, then reducing the number of strippings might be entirely allowable.

The settings from the feed plate to the licker-in should be governed by the weight of the lap fed in. Generally speaking, from 8/1000 to 12/1000 of an inch are good settings. When setting the plate, the gauge should slide along quite freely and at the same time turn the licker-in slowly by hand so as to be sure that it is clear over the entire length.

The amount of waste that is removed at the knife bars is governed to a great extent by the number of bars used, the angle at which the bars are set, the distance of the bars from the licker-in, the distance allowed between each bar, the distance from the first bar to the licker-in, the distance from the bars to the screen and also the bevel of the bars. When only one bar is used the stock is not cleaned as thoroughly as it might be, and more of the short fiber will be removed than would be when two bars are used.

The screen should be drawn as far back as possible and two knives should be used when carding coarse work. The first knife should be set about ⅞ of an inch from the feed plate. The second bar should be set one inch distant from the first knife bar. The second knife bar should be set about one inch from the front of the under screen. The point of the knives should be set with a number 10 gauge from the licker-in with the heel of the bevel of the knife bar ¼ inch from the teeth of the licker-in.

The closer the knives are set to the licker-in the less

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short fiber there will be removed from the stock. This fact is quite obvious, as the fibers do not have the same opportunity to fly away from the licker-in when using a close setting that they would have if a wide setting were used.

A knife having a short bevel will not remove as much waste as a knife that has a long bevel. A long bevel does not set as closely to the teeth of the licker-in, at the heel, as a short bevel does, and consequently a long bevel gives the fibers greater opportunity to fly away from the licker-in. About one per cent to one and one-half per cent waste is the general average removed by the knives and grid bars.

The cylinder casing should be set as high up between the cylinder and licker-in as possible. A number 10 gauge is a good setting to use at this point. The front of the cylinder casing should be set from 3/6 to 1/4 inch from the cylinder. As a rule, the "button" of the gauge is used for convenience. By setting the licker-in to a number 10 gauge at the back and about ¼ inch at the front, a very small percentage of waste will be removed. If it is desired to remove more waste at this point it can be done by setting the front of the casing up closer to the licker-in.

A good setting from the cylinder to the licker-in is a number 7 gauge. The gauge should move freely, just a slight tension should be felt as the gauge is drawn along. The cylinder should be turned very slowly to make sure there are no high spots rubbing. This setting should always be made before the licker-in is removed for setting the cylinder under-casings.

The back plate should be set from 10/1000 to 25/1000 from the cylinder.

The setting of the flats is one of the most important points in good carding. There are two methods used in flat setting, namely, straight settings and graduated settings.

With the straight settings a number 7 to a number 9 gauge would be used for fine work and a number 10 or number 11 gauge would be used on coarse work—with the graduated settings on fine work, generally 7-7-8-8-9 are used, and on coarse work the settings used would be 9-9-10-10-11.

For the special benefit of any of the readers who are not familiar with card grinding, but who might be interested, I will give just a brief description of two good methods in use for setting the flats down to the cylinder.

The first method is to remove two flats, not together, but so that there will be a space, then a flat, and then another space, or so that the flat that is going to be set to will have a flat removed on each side of it. With this method we make the first setting, then turn the flats until the flat we are setting to comes over setting point No. 2. This is repeated until all points have been set.

The second method is to remove five flats so that they will all come over one of the setting points. To do this, remove flat No. 1 at the back of the card. Then with this as a starting point, count off the number of flats that would be equal to the number of flats between the front and second setting screws and remove flat No. 2. Then from flat No. 2 count off enough flats to equal the number of flats from the second to third setting screws on the card. This is repeated until five flats have been removed. Then the flats are turned until flat No. 1 comes over setting point No. 1. There will be a flat out over every setting

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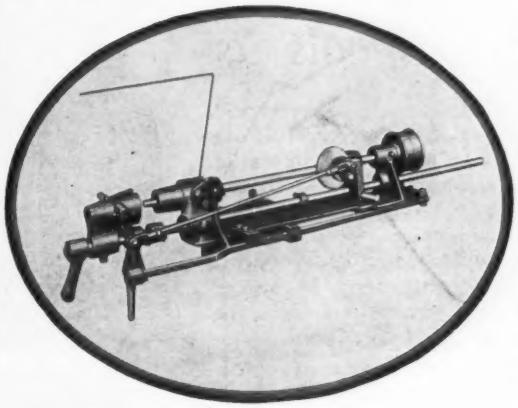

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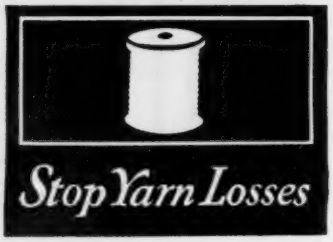

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point and all points can be set without turning flats again. It is good dope when setting flats to draw down snug and then back off slightly until the required tension is felt on the gauge. This removes all back-lash.

Usually the number of flats used on a card is from 100 to 110, of which 39 to 43 would be actually at work.

There has been quite some talk of reversed flats in the past few months. Some claim it is a great advantage, while others say they notice no difference in the work. My own opinion of reversing flats is that it is just so much good time wasted that could be put to more profitable use.

When setting flats, don't set to a "tight 7" or a "loose 9." If setting to a gauge, set to it. Don't have it so tight that you can't pull the gauge out or so loose that you can drop a wrench through the setting.

The flat chains should be kept at the same tension on both sides. If the flats are too tight they will run heavy and cause excessive wear on the chain's worms and gears. Also, if the flat chains are too slack the flats will be sluggish in coming into working position.

There should be a regular system adopted for oiling the flat chains. If they are run dry the holes in the links will wear, or "stretch," as some men term it. This condition will eventually cause trouble at the front plate and also at the flat comb.

The flat comb should be set just close enough to properly remove the strips from the flats. Be careful not to set too close.

When setting the flat brush, use care not to set the bristles too deeply into the wire, or else the cotton will be forced further into the wire instead of being brushed out.

The top flats should be ground about every eight weeks. A good speed for the grinding roll is approximately 600 r.p.m. It is important that the proper depth be ground. If ground too deep the wire will be burned and roughened, and if not ground deep enough, the wire will more likely be polished than to be sharpened.

When setting the front plate it should be brought up as far as is practical between the cylinder and plate. Generally a 17 or 22 gauge should be used between the front plate and the flats. If the front plate should be set too low, too great a percentage of long fiber will be found in the flat strips. The weight of the flat strips is regulated by the setting of the front plate. Setting low will produce a heavy strip and setting high will produce a light strip.

The doffer gives best results when set with a number 5 or number 7 gauge to the cylinder. To make properly this setting the doffer should be drawn up tight to the gauge and then backed off to the proper setting. This is to remove back-lash in the setting screws.

The doffer comb should be set with a number 7 gauge. When setting the stroke of the doffer comb it should be set just slightly below center. If it is set too high it will not strip the doffer properly. If it is set too low the web will sag between the comb and the calender rolls.

The can table should be set forward of the tube gear. When using a 10-inch can the table should be set 1½ inches forward. For a 12-inch can it should be set forward 1¾ inches of the tube gear.

The stripping roll should make from 400 r.p.m. to 425 r.p.m. It is a good idea when stripping the cards to strip, not in rotation, but strip No. 1, 3, 5, etc., coming back later to strip No. 2, 4, 6, etc. This helps to keep the work more

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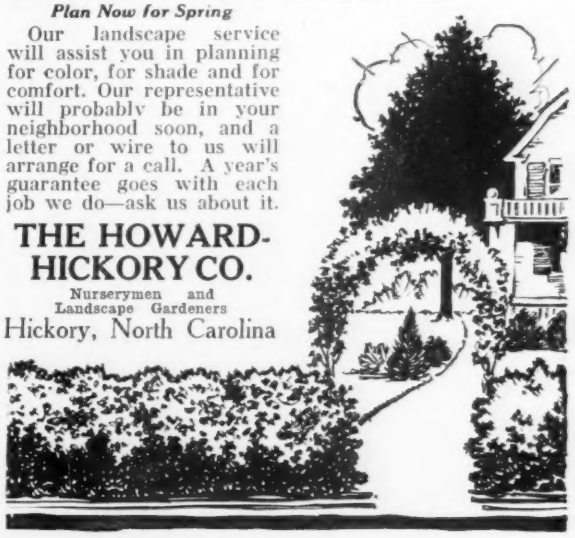

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even, should the light sliver be allowed to run into the can too soon after stripping.

Some of the points to watch in the card room are:

Be sure the cards are set properly.

Strip often enough to keep the wire clean. If the cards are not stripped often enough for the grade of cotton being run the web will be uneven and full of neps.

Watch the top flat strips regularly.

Keep tab on the percentage of waste that is being removed from each card. About five per cent is the average figure.

If the web is rough and torn it is caused by bunches, etc., on the screen rubbing the doffer. As a rule bunches and slugs that have caught on the screen can generally be dislodged by turning the doffer in the reverse direction.

If the front plate is rough the fiber will cling to it and this will produce a stringy web.

When thick and thin places appear in the web the trouble can generally be traced to uneven laps or feed rolls that are not properly weighted.

If the web follows the doffer the trouble may be that the comb is running too slowly or is set too far away from the doffer or else it is set too high in relation to the center of the doffer.

The web will sag between the doffer and the calender rolls if the comb is set too low or the hole in the trumpet is too small to take care of the weight of sliver being run. Sometimes the web will sag because the top calender roll does not drop down properly onto the bottom roll.

If the comb becomes scratched or rough in any way it will cause the web to stick to it. The comb should be smoothed with pumice stone and must always be rubbed in one direction. Sometimes the web has a tendency to stick to the comb in very dry frosty weather. Humidity will cure this fault. Sprinkle a little water on the floor around the doffer.

Whenever the production is figured from the speed of the doffer an allowance of ten per cent is generally made.

Some men allow the sliver to run on the floor for five minutes and then weigh it. This weight multiplied by 12 gives the production per hour with no allowance for stripping, etc. I do not much approve of this method.

All doffers should run the same r.p.m. when on the same class of work. I once worked in a mill where the doffers were making anywhere from five to thirteen r.p.m. If they had evened them up, a much better grade of work could have been made.

Do not allow the cans to be run so full that the tops have to be pulled off and put on the floor. It is done to a great extent, but it is poor policy. There is too much waste and dirty work made.

Ten-inch cans are the most practical. Larger cans hold considerably more sliver but they occupy so much space that they are a nuisance from a drawing frame tender's standpoint. It is hard for a tender to piece up a broken sliver when an end breaks down as they cannot get close enough to the frame. They generally content themselves with throwing the end at the rolls, with the result that a thick or thin place is made.

I suppose I had better "sign off" now or the first thing I know we will be out in the cloth room somewhere.

C. C. (N. J.)

Imagination the Inventor.

EDITOR COTTON:

I have read with interest the articles "Wanted—A Prophet" on page 995 and "Life in the Mill in 1950" on page 999 of the August number of COTTON and find in them much material for thought concerning the future development of the cotton mills.

It has been stated that one reason why the English are successful is because they are always ready to face the facts, no matter how ugly the facts may be.

Sir William Beveridge put it well, as reprinted in "Sterling Products Magazine," "Prosperity in the future can only be secured by working for it, by working harder or at least more effectively, more scientifically, more harmoniously than others; it will not fall into our laps as of old."

There are turning points in the history of any industry, just as in the histories of corporations, individuals and nations. Those who have the courage to adjust themselves to the new conditions usually find a way out. Those who wait optimistically for a return to normalcy often find that normalcy is as difficult to recapture as youth.

The prosperity and a sufficient share of the better paid work of the textile industry in the future of the cotton mills depends at the bottom on two things, the financial resources and the efficiency of its machinery and employees Other lines of business have prospered exceedingly in the development of scientific management and radical changes in factory management.

Many mills today are managed as of yore, there being a fearful waste of energy, of human strength and thought, and waste of time and materials. Labor-saving management is only one of many elements of scientific management. The foundation of scientific management means, "The critical observation, accurate description, analysis and classification of all industrial and business phenomena relating to the industry."

Social and industrial progress is impossible in any community or country where the natural wants of men are stifled in their development. All business progress is the result of invention, and imagination is the inventor; Ford is an example.

No man of feeble imagination ever achieved real success in business. And the two articles in the August issue of COTTON give visions, or ideas, for the future development of the cotton mills.

Any radical change in cotton mill management must be a gradual evolution out of that which preceded it. The present systems or lack of systems, with their good or bad points are themselves the result of long evolution. Men have become accustomed alike to the strong or weak elements in the systems under which they work, and cling naturally to that which they have been accustomed to do. Cotton mill executives being busy men are content with anything so long as it pays.

We all know that any new system or labor-saving device used scientifically must first be proven to be economical before being adopted. I am strongly in favor of scientific methods and research for the cotton mills and hope to see more discussion in COTTON on these lines, as I firmly believe that the future of the successful running of the cotton mills depends on encouraging and introducing work of

The Franklin Package

Solves Many Dyeing Problems

Yarn is wound directly from bobbins, cones, tubes, or cops, to the Franklin tube, on which it is dyed.

In coloring by the Franklin Process the dye is forced completely through the package in both directions, insuring absolute penetration of every fibre and giving greater solidity, evenness, and brightness of color.

The Franklin Package, fitted with a wooden skewer, can, after dyeing, be used directly in a creel or in any other manner, delivering either by rotation or over end. Some mills report it saves as high as 5c. a pound in winding costs.

Are you a mill executive? If so, be sure to investigate the possibilities of this commission dyeing service. Send to-day for our handsome new book explaining the Franklin Process of dyeing in the wound form, and suggesting ways in which manufacturers can use this service for better profits.

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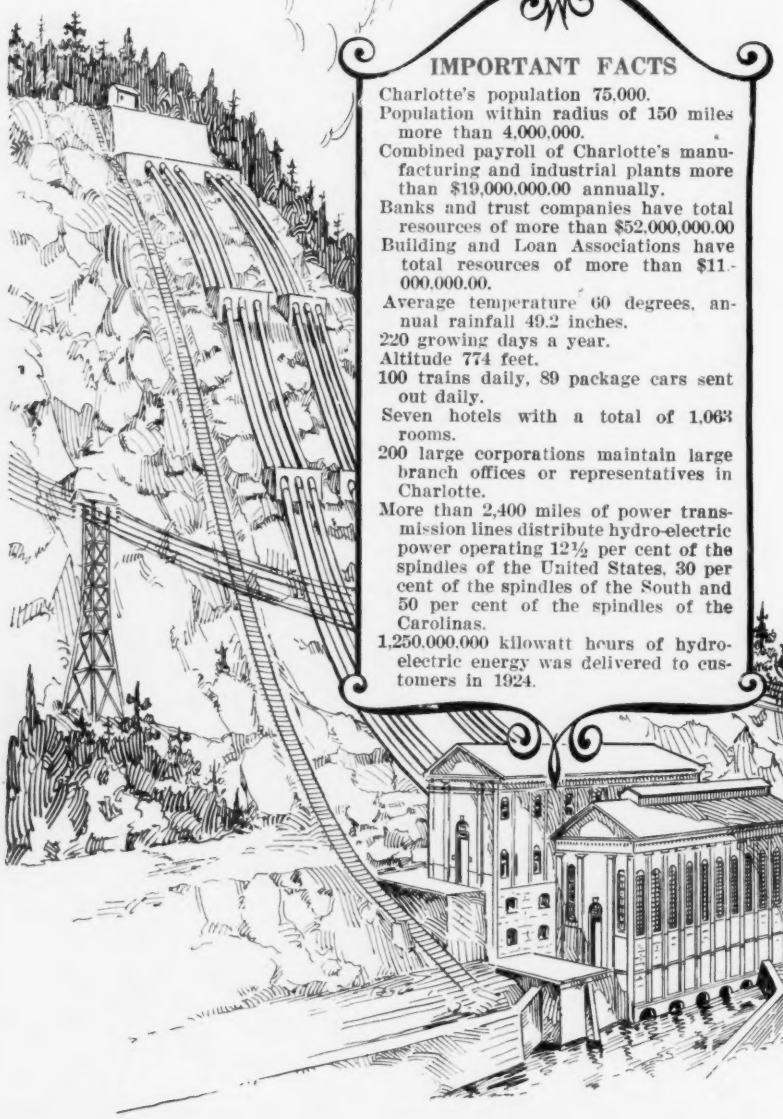
Charlotte

The Center of the



IMPORTANT FACTS

Charlotte's population 75,000.
Population within radius of 150 miles more than 4,000,000.
Combined payroll of Charlotte's manufacturing and industrial plants more than $19,000,000.00 annually.
Banks and trust companies have total resources of more than $52,000,000.00
Building and Loan Associations have total resources of more than $11,000,000.00.
Average temperature 60 degrees, annual rainfall 49.2 inches.
220 growing days a year.
Altitude 774 feet.
100 trains daily, 89 package cars sent out daily.
Seven hotels with a total of 1,063 rooms.
200 large corporations maintain large branch offices or representatives in Charlotte.
More than 2,400 miles of power transmission lines distribute hydro-electric power operating 12½ per cent of the spindles of the United States, 30 per cent of the spindles of the South and 50 per cent of the spindles of the Carolinas.
1,250,000,000 kilowatt hours of hydro-electric energy was delivered to customers in 1924.

MANUFACTURERS looking for a central location where climate, raw materials, sufficient labor, power and transportation are favorable, find Charlotte the ideal city for erecting new plants.

Because of its ideal location and splendid transportation facilties, Charlotte is known as the industrial and commercial center of the New South. Four trunk line railroads radiate in eight directions providing unexcelled transportation for the distribution of products at favorable rates.

The cheap, convenient, hydro-electric power has caused the section surrounding Charlotte to lead the entire country in textile develop-

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Charlotte,

North Carolina

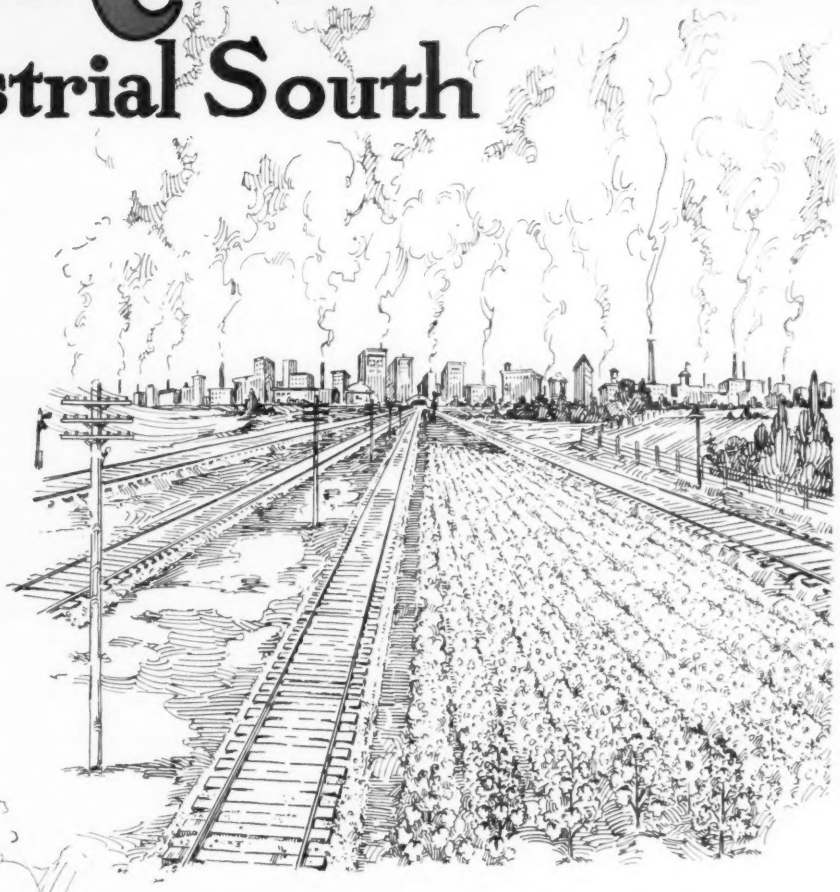
New Industrial South

ment for the past decade and a half.

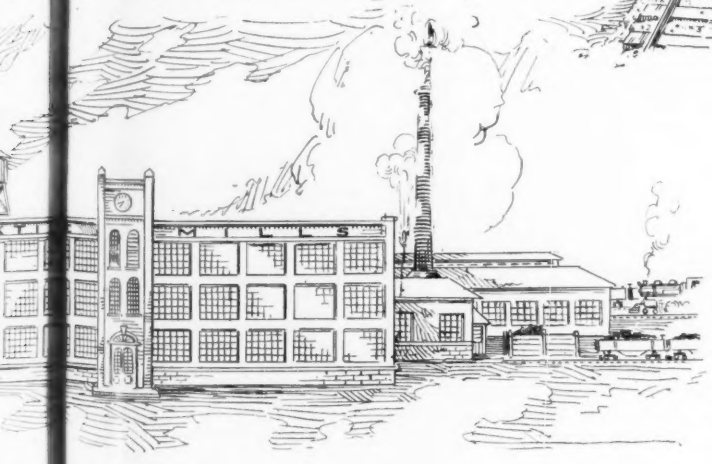
Not only textile products are manufactured successfully in Charlotte, but cotton seed products, tobacco, furniture, minerals and lumber are produced and distributed from this section.

The labor conditions in Charlotte are of the best. American white labor is abundant and free from unrest. No better labor conditions exist in America.

The population of Charlotte's trading territory is denser than that of any similar territory in the Southeastern States, which offers unbounded opportunities to mercantile establishments.



COMMERCE
North Carolina



Mail the coupon to the Charlotte Chamber of Commerce—Detailed information relating to Charlotte's advantages as an industrial location and a place to live in will be mailed.

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It is this same high tensile strength, *plus* the velvety softness and lustrous beauty of the yarn itself, that insures a ready sale for all garments in which TUBIZE is used. The presence of TUBIZE means greater attractiveness and longer wear—and customers soon find it out.

It pays to specify Tubize

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TUBIZE ARTIFICIAL SILK COMPANY
of AMERICA

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Hopewell, Va. Philadelphia

this kind. As the saying goes, "Whatever is may be wrong. I am going to investigate and find out whether it is right or wrong." R. I. G. (Mass.)

Breaking Strength Formulas.

EDITOR COTTON:

Draper's formula (please note—I am talking about the *formula,* not the table) for the breaking strength of cotton yarns is incorrect, or rather inconsistent. This may sound a bit startling, or to some it may even sound absurd; for, who does not know that it is *the* American authority on the subject and for years accepted by all as authentic without question. Nevertheless, I am telling the truth, and I will show why it is inconsistent before I close this letter.

As I said in a previous letter to this department, there is a limit to the mathematically deduced formulas, beyond which our results will be seriously in error and somewhat even absurd—experimental formulas, for that matter. There is a limit for Draper's formula also. The purpose of this letter is just to point out that limit. By knowing its limitations, one can make better use of it, and, after all, is that not what we are striving to do right along?

It must be remembered that Draper's table was first made up from purely experimental data, as explained in their "Texts." And then curves were plotted and the nature of the curves observed. And right here the fact that their old tables do not conform to any mathematical formula is very good evidence that the formula by which their new tables were formed must be much later than the old tables. While I say that the formula is inconsistent, it by no means implies that the whole set of tables is useless or no good at all. It simply means that the formula cannot be extended beyond its limit . . . the less to infinity to embody all cases. While the table that is computed from the formula at its best, can only be a fair approximation.

The formula itself is very simple, as the readers will readily see. To put it in the simplest form, the nature of the curve is something like this: the product of the yarn skein break in pounds, and the yarn count (number) is very *nearly* equal to a constant number. It would be all the simpler if it actually equaled the constant. Unfortunately, that is not the case. If the reader has a Draper's "Textile Texts"—the 4th edition—at hand and will turn to page 108 or 109, or thereabout, he will doubtless find this formula and tables. Pay special attention to the "New" table, for that is the table that was made up by the formula. To be sure the formula as given in the "Texts" is in another form than the one given above, but it will be a very simple matter to convert it into simple form as given. The formula in its simple form is easy to be understood and is similar to the English one that I am going to give in the latter part of this letter, with which this is to be compared. For more detailed discussion of each factor of the formula, also refer to another letter entitled "How to Design the Breaking Strength," which appeared in the May ,1924, issue of COTTON.

Note just how the different authorities modified the foregoing formula. Compare the merits of each.

If we let the letter *"B"* represent the yarn skein break in pounds and *"C"* represent the yarn count, *"A"* a constant and *"K"* another constant, Draper's formula in algebraic form is:

$$CB = A + KC \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

So Draper modified the formula by adding factor (K), which can be positive or negative. *"K"* takes different values according to different twist multipliers used, while *"A,"* according to different processes. For carded yarn *"A"* = 1900; for combed yarn *"A"* = 2600—according to Draper's. And all told $K = +1$, for warp (carded) yarns where the twist multiplier is approximately 4.75; $K = -13$, for filling (carded) yarns where the twist multipliers average 3.25; and $K = -4$, for combed warp yarn. Wm. Smith, principal of the New Bedford Textile School, by applying Draper's formula and through many tests, found that $K = -7.5$ for filling combed yarn.

The Hyde's formula (English authority).

$$CB^n = P = \text{a constant} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

where n is variable and P is constant. So Hyde modified the fundamental formula by modifying the factor B. Here B and C have the same meaning as used in formula (1). Hyde's table can be found on page 40, the "Standard Cotton Mill Practice and Equipment," 1918 edition, published by the National Association of Cotton Manufacturers, Boston, Mass. In the table $n = 1.25$ for all the colums. $P = 4600$ for column, "Super Extra"

$P = 4400$ for column, "Extra"

$P = 4200$ for column, "Good"

$P = 4000$ for column, "Fair"

$P = 3800$ for column, "Ordinary"

Now if we take Draper's carded filling for example, we can readily see that the skein break in pounds would be 0 (or nothing) for yarns numbering 146, which we know is not right; and it would be negative for yarns above 147, which is absurd, as well as meaningless. But that is what we get by applying Draper's formula (1). This clearly shows the inconsistency of the formula. On the other hand, it must be remembered that it gives fairly good approximations within certain limits, for instance, carded yarns above 8 and below 100 as given in their tables. While Hyde's formula is consistent in that it will not give zero or negative numbers for skein breaking strength for fine yarns, it gives entirely too low a break for yarns of low numbers, as one can readily perceive from the table. It agrees fairly well with the experimental data within the limit, say, from 20s to 13s yarns. It must be understood that this limit is more or less arbitrary and need not be regarded as absolute and unalterable. The rather too low break given in Hyde's table for low number yarns leads me to the belief that it is purely computed from the formula (2) for those low number yarn breaks without actual tests at all. I had an inquiry made about this matter, but so far I have not been able to find out the truth about it. I certainly would appreciate some "Old Timer" coming along and telling us about it.

H. H. Y. (CHINA)

Mossberg Pressed Steel Corp., of Attleboro, Mass., announce the establishment of a New York office in the Grand Central Terminal, Room 2051, with R. D. Smith in charge. The company also recently opened an office at 101 Slaughter Building, Dallas, Texas, in charge of Russell A. Singleton.

ARCY—

A Means of Getting The Most Value From A Dollar's Worth Of Starch

ARCY is a product used in warp sizing and cloth finishing for converting ordinary thick boiling pearl starch into a soluble form, the solutions of which are transparent and remain fluid at lower temperatures. The active principle of ARCY is of French origin and has been used successfully in Europe for some time, more particularly in France, Germany and England.

There are many kinds of diastases which convert starch, but which have no value in textile mill use in preparing starch mixes, because they will carry the conversion into sugars, to the utter destruction of the desirable properties of the starch. *ARCY does not contain malt diastase nor other similar diastases which produce sugars* in the size kettle. Herein lies ARCY'S extreme value to the Textile Trade.

ARCY is not supposed to replace the usual softeners used in the size mix, but when used with ordinary thick boiling pearl starch in the proportion of approximately 4% of the weight of the starch, completely liquefies the starch, producing practically a non-congealing thin size solution, with marked penetrating and binding properties.

Among the Many Advantages Resulting From The Use of the Less Expensive Thick Boiling Pearl Starch Liquified with ARCY Are:

Less shedding of short fibres, due to the conservation of all binding properties of natural thick boiling starch. ARCY liquefaction of natural starch is *Nature's* mild way of producing slow congealing starch solutions, without lessening the original desirable properties created by *nature*. Hence the ability of the dressed warp yarns to withstand the chafing action of the reed without "shedding."

No lumps in the size box nor in the pipe lines. Each granule of starch is converted in the cooking kettle into slow congealing liquid.

Increased tensile strength. Owing to its greater penetrating power the internal fibres are cemented together, producing a composite thread, reducing stoppage at the loom to a minimum.

Smooth finish. The yarn is smooth and does not have a sawtooth feel, because the starch has been completely liquefied.

Maximum life to cotton harnesses.

Minimum stoppage of the loom due to knots breaking the companion thread when weaving. Also the smooth surface of the warp yarns prevent the threads from hanging together in the shed, where the shuttle breaks them.

Less "net" waste where the mill desires to take advantage of the possibilities of using starch mixes of greater degrees of concentration.

Excessive humidity is not required in the weave room.

Last but not least, the considerable saving to the mill in the purchase of all starch used.

Manufactured by

American Rapidase Company, Inc.

Sole Distributors For All Southern States:

DRAKE CORPORATION

NORFOLK, VIRGINIA

The Cost of Loom Supplies.

EDITOR COTTON:

I am glad to respond to the question of "J. D. S. (S.C.)," who asked in the December issue for the maintenance cost per loom per year on automatic looms 36 to 40 inches in width, which have been in operation for 15 to 20 years on print cloths, and asking that these figures cover all loom parts including belting, but exclusive of reeds and harness.

I believe it is a good thing for mills to exchange figures of this kind as they furnish a basis for comparison so that each of us may know how his figures check up against the other fellow's costs.

Answering the question, it cost us $4.10 per loom for all supplies including belting, but exclusive of reeds and harness, to operate our looms during 1924. Our oldest looms have been operating practically day and night since 1916, while a large majority of our looms have been operating day and night since the year they were put in, that is 1922. Taking the ten months already passed in 1925 for which figures are available, and working the cost for the year out upon that basis, we find that we are going to spend $5.75 per loom. This is divided up as follows:

Belting	$1.16
Buckles, Bolts, Screws	.27
Shuttles	1.24
Check straps	.28
Lug straps	.16
All other strapping	.24
Pickers	.28
Picker sticks	.07
All springs	.34
Thread cutters	.15
Temple parts	.10
All other parts	1.18
Sundries	.28
Total	$5.75

Our looms are Draper automatic looms, on print cloth numbers averaging about the widths specified by "J. D. S." They are practically all equipped with feelers, and this would increase the cost of supplies. I think we have used entirely too many supplies this year, and I do not think it should cost more than $4.00 per year to operate a 40-inch loom on single shift.

As stated, we are running our looms day and night, and while the figures I have given are for single shift, yet operating looms day and night I think more supplies would be used than on just one shift.

I might state further that we find a great variation in the cost of each section, as one of our sections ran as low as $2.52 per loom per year, while another one of the same age ran as high as $6.94, and one other section only four or five years older ran as high as $8.09.

We hope this is the information desired. We are constantly improving our records, and can always give you better figures that we have been able to do in the past.

L. D. (S. C.)

EDITOR COTTON:

In regard to loom maintenance cost, we have consulted our records on loom supplies, and find that we average around $7.96 per loom per year for our 30-, 32- and 36-inch looms for supplies—including everything except reeds and harness. This figure is a little high, but we use no local castings on our looms and we keep them right up to snuff all of the time. In other words, we don't try to economize too much on supplies. We use as much economy as we can to be safe, but we try, first, to keep the loom in good shape. We do a lot of overhauling, and when this is going on, all the worn parts are discarded for new parts. We think this best in the end. It may not show a direct saving in the supplies, but it does in the products turned out.

If you secure these figures from several mills, I would be interested in seeing them published. B. T. (GA.)

EDITOR COTTON:

I find that for six months, the expense of 36-inch looms, 25 years old, runs about 90 cents per loom per month. In the last ten years I had these looms all overhauled at an additional cost on 146 looms of about $1.00 per loom. This would add a few cents to the loom.

From my experience on old looms I would say that $12.00 per year per loom would be about right. These looms are running twills, which is a very particular class of goods, and I rather think that a sheeting loom would probably get by with a little less.

These figures do not include belting on the looms, nor reeds and harness. This would of course make some difference, but just how much I cannot tell because it is only about a year since I started to keep a record of belting on individual looms.

I am glad this question was asked, because I had never figured out the cost per loom on supplies, but we keep a strict account of everything that goes to these looms and it was an easy matter to take one section of looms and get the total cost and average it up. H. R. (GA.)

EDITOR COTTON:

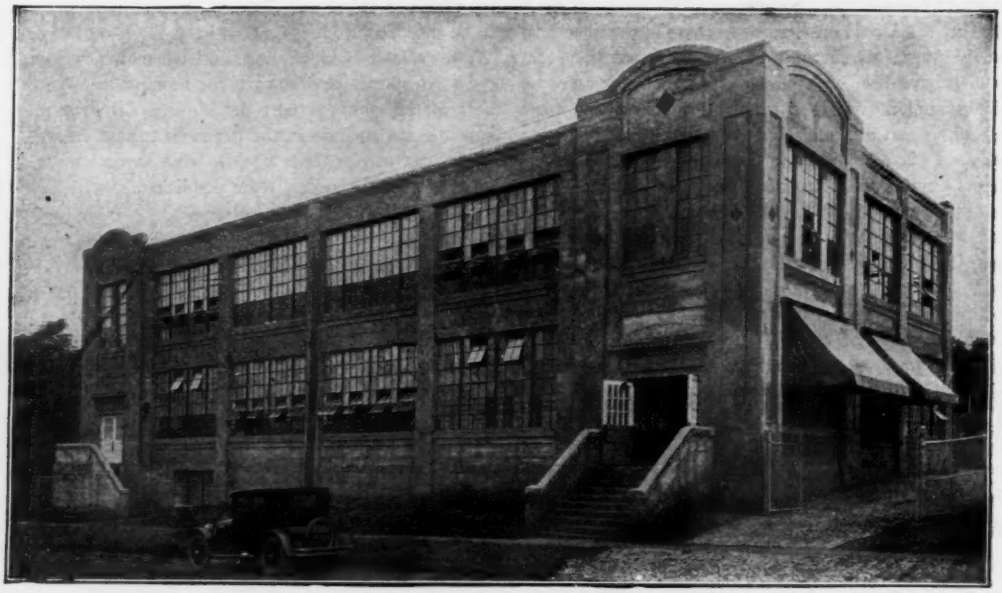
With regard to the question on the cost of loom maintenance, I cannot do better than give figures covering costs on looms in our mill, taking one unit of 550 looms as an example. Of this number, 300 looms are running on a high-grade pillow tubing every day in the year. The remaining 250 looms are employed in weaving shirting, such as broadcloths and reps, of a rather high construction. These looms were new fifteen years ago and have been in constant operation since that time—54 hours a week. At the present writing the cost of maintenance and supplies, including all loom parts, belting, oil, power, light, fuel, and taxes, figures about $11.00 per loom a year.

Y. T. (MAINE)

EDITOR COTTON:

In answer to "J. D. S." with reference to loom supply costs will say that our looms are about 20 years old and have been running day and night. They are 40-inch Model E. All supplies including belting, but exclusive of harness and reeds, average $14.95 per loom per year of 52 weeks and 60 hours run per week. V. D. (N. C.)

Ciba Company has distributed Circular 241 describing some new Diazo Browns—Diazo Brown BW, 2GW, RW, 3RW, and SW, which can be coupled with either Beta Napthol or Yellow Developer C or Toluyene Diamene, it is stated, permitting a variety of color combinations. Samples showing the new colors after various treatments with developers, and fastness tables, are included in the circular.



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On account of the ever increasing use of Rayon (artificial silk) by Southern cotton mills, we are making a reed particularly adapted to the Rayon yarns.

Special attention is necessary to the finish on the wire used in these reeds, which finish requires approximately three times the length of time usually given to regular reed wire.

There is, however, absolutely no extra charge for this special finish as we invoice Rayon reeds at our regular standard prices.

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"Duplex" Loom Harness (complete with Frames and Heddles fully assembled).
Drop Wires (Nickel Plated, Copper Plated or Plain Finished).
Flat Steel Heddles—Harness Frames—Selvage Harness—Leno Doups—Jacquard Heddles — Lingoes — Improved Loom Reeds—Leno Reeds—Lease Reeds Beamer Hecks—Combs.

Magnesium Chloride.

EDITOR COTTON:

The use of magnesium chloride as a sizing agent for cotton goods has been the subject of much comment of late, because it was believed to be a dangerous article to handle. Recent investigations, however, have disproved, in a measure, these allegations.

It was found that an aqueous solution of it does decompose below a temperature of 225 degrees F. even if there is an excess of air, presence of cellulose, or of the usual sizing and finishing agents. The amount of hydrochloric acid set off by heating to a temperature of over 545 degrees F. is only two per cent of the total weight of the magnesium chloride. It is also noted that finished fabrics containing magnesium chloride do not become altered unless submitted to a temperature beyond 254 degrees F., which of course, permits of their being treated with steam without pressure. A prolonged high temperature when applied to cotton simply deteriorates it; and it is best to dry cotton at 212 degrees F. The only thing to carefully observe in the use of magnesium chloride is that when it is employed along with the ordinary finishing agents there should be no change of method in the subsequent treatments. Singeing of goods containing magnesium chloride is not good on account of the heat of the plates.

Concerning moisture in cloth intended for calico printing, would say that the most favorable climate to calico printing is where the atmosphere in the finest weather contains large quantities of watery vapors.

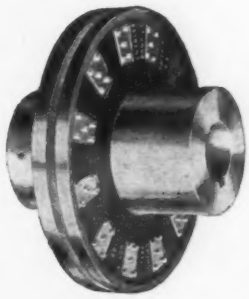
If a piece of calico is thoroughly dried before a fire until it loses no more weight, and is then hung up in the air, it will be found that it will have attracted some of this watery vapor into its pores, and through this action increases its weight at least ten per cent. Now while in this condition, it will appear dry to the average mill man; yet to an experienced printer accustomed to handling calico in all its forms, it will be found moist.

The advantage of having a certain amount of moisture in the cloth is that it is rendered more flexible, less elastic and more capable of retaining any form into which it might be pressed, and consequently takes the impression from the printing roller in much better form.

Referring further to magnesium chloride we would say, that while the bleaching of cotton yarn is but a simple operation, the bleaching of cotton piece goods is much more complicated, because a number of substances such as starches, wax, soap and tallow may have been used as a preparation for weaving. It is of the most importance that these substances be removed before the goods undergo the actual operations of bleaching. The addition of magnesium chloride to the size for the purpose of making the goods soft and heavy or of zinc chloride in order to prevent the formation of mildew may give trouble in bleaching and dyeing. Cloths containing these substances are often *tendered* while singeing and the practice of spraying a solution of magnesium chloride on the cotton warp to make it weave easy should be condemned.

Chloride of magnesium should never be used (or zinc) on goods that are intended for bleaching. These substances have been the cause of a great amount of damage at

For Direct Connecting Motors to Spinning and Twisting Frames



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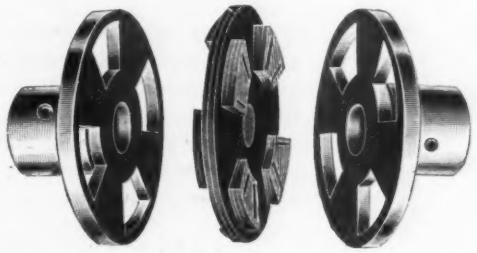
Grundy Couplings are designed to render the utmost in service on all direct drives. They are made according to specifications determined by an analysis of the textile industry. They are made in a variety of sizes, working on any direct drive—with fewer repairs and less attention than any other coupling on the market. Thousands of these couplings are at present in use in various Textile Mills throughout the country. Illustrated folder showing the "Grundy" actually driving Spinning and Twisting Frames will be forwarded upon request.
The following salient features should soon prove to you why

Grundy Patent Flexible Insulated Coupling

should harness your direct drives:

1. Takes care of uneven strains.
2. Self-adjustment insures perfect alignment of shafts.
3. Can be used whether insulation is required or not.
4. Perfectly balanced, and adapted for revolving at high speeds.
5. Runs in either direction; is close connected; easy of access; practically no repairs.
6. There are no projections to cause damage.
7. Maintains a positive and silent drive; free from objectionable hammer action features.



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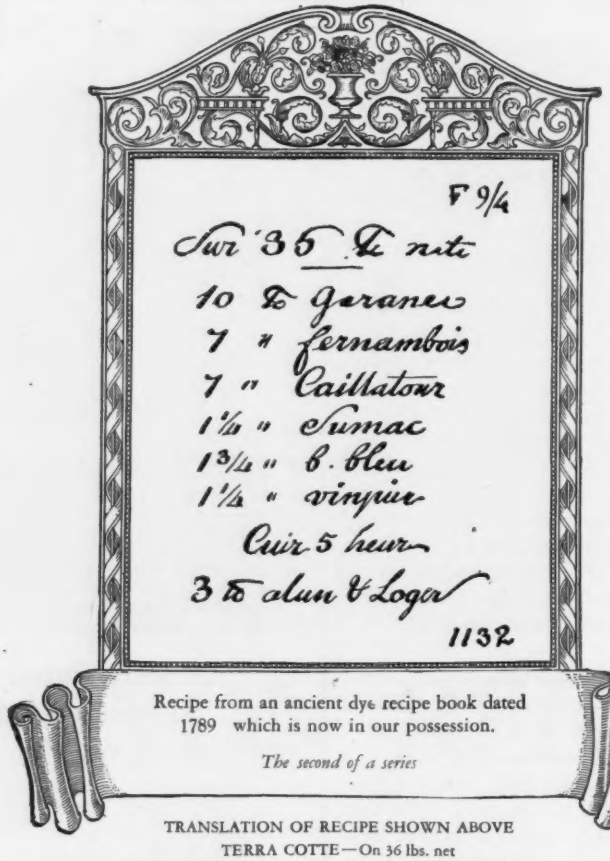

Recipe from an ancient dye recipe book dated 1789 which is now in our possession.

The second of a series

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TERRA COTTE—On 36 lbs. net

10 lbs. madder
7 lbs. Fernambuca
7 lbs. Cahinca root
1¼ lbs. Sumac
1¾ lbs. blue wood
1¼ lbs. vinegar.
3 lbs. Alum
Boil for 5 hours and hang up

LIKE the Ancient Mariner this time-dimmed French dye Recipe Book has returned to tell an interesting story to the dyestuff industry of today. When it was compiled by hand—136 years ago—the practitioners of the art of dyeing fabrics worked with crude equipment and without the colors of our times, which are of far better fastness and much easier of application. The highest requirements of industry are today met by the types offered by us, and include the products of

GRASSELLI DYESTUFF CORPORATION

Plants: Rensselaer, N. Y. Grasselli, N. J.

and

FARBWERKE, VORMALS MEISTER, LUCIUS & BRÜNING

LEOPOLD CASSELLA & CO., G. m. b. H.

and other European manufacturers

GENERAL DYESTUFF CORPORATION

Successor to Dyestuff Department *of* H. A. METZ & CO., *Inc.*

Victoria Building, *Broadway and 5th Ave at 27th St.* New York, N. Y.

one time or another, especially during singeing. The high temperature to which the cloth is subjected decomposes the chloride of magnesium with the formation of hydrochloric acid. This acid tenders the goods although it may not be apparent until the goods are dyed or printed, then it often takes the form of stains, on account of the dye, etc., being absorbed unevenly. W. B. (ME.)

The Setting of Card Flats.

EDITOR COTTON:

Many writers give as the first setting, acting first upon the cotton, 11/1000, and at the second point 10/1000, and at the next point 9/1000, and at the next two 8/1000. Others give a different number of gauges. But most of them of late do set, and advise others to set, farther away at the first and second setting points, first acting upon the cotton, but all they give us is the settings. They never give us the reason, and many men who accept this as a general rule, set in this manner and let it go at that. The only reason the writer can see for such an idea is that some worsted overseer conceived the idea that cotton could be treated the same as worsted. It should be remembered that the staple never exceeds 2 1/25 inches in length, while worsted wool is sometimes 18 inches long, or a part of it anyway.

First, I will try to give a reason why all top flats should be set alike, which is easily explained granted the lap has been properly treated and does not exceed 12 ounces to the yard 40 inchs wide, the flats should be set to 9/1000 gauge because every top flat should do the same amount of work, and also, the flats are not stationary. So if you set away at the first setting point to save the flat or the cotton, a great mistake is made, because if it is to save the wire on the flats it is only a matter of flats traveling a few inches before it gets the bulk of cotton. Again, if the licker-in conveys to the cylinder a certain amount of cotton to be passed under the flats and the first flat is set away from the cylinder, the flats at the last setting point are called on to do the bulk of the work. In other words, the amount of cotton taken from the licker-in has to pass in a certain space and that the flats nearest the cylinder will get the bulk of the work. No one can deny on the other hand that by setting the first flats away at the first setting points the working carding surface of the cylinder is reduced, and the only excuse that can be advanced for such a setting is that the fibers are in a tangled state and that the combing should be gradual. This is all theory, not practice, and I would advise all carders who conceive the idea that this kind of setting disentangles the fibers to pay a little more attention to the back of the card.

All overseers who believe in this progressive setting admit that no injury to the fibers will result if the distance between the grip on the staple and the bite is 1/8 of an inch longer than the staple. Now measure the distance from the edge of the flat and the heel of the flat that grips the cotton to the edge of the next flat and it will be found that this argument that the cotton is injured by not receiving a gradual combing is a very weak one indeed. So if setting the first flat as close as the next working one injures the staple, then every one of us must admit that we injure the staple from the nips of the feed roll and the bite of the licker-in. Our aim is simply to point out the

IN a number of southern mills Tannate Belting is adding two or three to the turns per minute of the front rolls of spinning frames.

When you multiply this increase by the number of minutes per hour, per day, week, month and year, it means a big annual increase in output.

This "front roll" showing is but one possibility of Tannate. It is profitable on other textile drives in cotton, wool and silk mills.

Its long life at hard work, and "Tannate grip" saves you trouble and increases your output.

J. E. RHOADS & SONS

Philadelphia - - - - - - - 29 N. Sixth St.
New York - - - - - - - - - 96 Beekman St.
Chicago - - - - - - - 316 W. Randolph St.
Atlanta - - - - - - - - - 67 S. Forsyth St.

Factory and Tannery, Wilmington, Delaware

defect for the good of all concerned, and the sooner those who believe in a progressive setting see the light, the better it will be for themselves.

Progressive setting is not a new setting, for this method was in use when the stationary tops were in use. The tops at that time were caused to assume an angular position relative to the cylinder, as in the present time, which was the proper thing to do at that time. The tops first acting upon the cotton were set to a 13/1000 inch gauge, the middle tops at 12/1000 and the front tops at 11/1000 of an inch. In those days the tops were nearly double the width they are at present, and so it was discovered that the detachment was as gradual with the tops set at 11/1000 of an inch as when set at 13/1000; also, that more combing action was received from more carding surface, so progressive setting was abolished.

This has long been forgotten, but many carders would have us do what has been abolished years ago. There might be something in the contention of progressive setting if the distance from heel to heel was not so great as the distance from the heel of one flat to the heel of the next flat, which is 1¾ inches. And by close observation it can be seen that the flats assume an angular position relative to the cylinder. The edge of the flat, called the toe, is the edge farthest away from the cylinder and the side of the flat nearest the cylinder and used for setting purposes is the heel, which is about 3/1000 of an inch nearer the cylinder than the toe.

Remember when setting the top flats, no matter what gauge is being used, if a No. 9, set to that 9; and do not say a "loose 9" or a "tight 9"; or if setting to a 10, not a "loose or tight 10," but a 10, for we have no such thing as a loose or tight gauge. BAB (N. C.)

Trouble with Static and a Remedy.

EDITOR COTTON:

In my several years of experience I have had trouble with cards getting full of electricity and causing undue waste and bad running work. I have tried live steam, hot water on the floor, cold water on the floor, windows all closed, and windows open, but have as yet found nothing satisfactory to eliminate this trouble. Years ago I lay awake nights trying to study out this great problem. I say "great problem," and think you will agree with me, because when the card becomes charged with electricity no first-class carding can be done, because the cylinder loads up; the sliver is too light; the web splits and knots up; and the sliver is lumpy. In other words, it would pay to let the cards stand rather than to run them when static electricity becomes prevalent.

During the number of years that I have served as overseer of the different departments in the mill I have come to believe that some day, some one would be smart enough to think of something that would help to remedy this peculiar feature of cotton manufacturing. I kept on thinking and trying everything that I could hear of to kill electricity in the card, until last year one of my friends said to me: "'A. B.,' have you ever tried mineral oil, about one per cent, to kill electricity on your card?" I told him no, but one day after that, when it was as dry as powder and fifty-two cards on white cotton went to pieces, when we got practically nothing but waste for about eighteen hours, I decided it had gone the limit. I secured a Pyrene can and filled it with spindle oil, spraying the laps lightly, and in one hour I was able to invite my superintendent to the card room and show him that the cards were really and truly running tip-top. I told him that I did not know what he would say to me if I were to tell him how they were started. He had been so fussy about oil that I could feel myself slipping, but knowing the great benefits I had derived from the use of oil on the laps I had to "let the cat out of the bag."

After that a friend of the superintendent came along and told him of a spraying system which was being used at a certain mill with success. A trip to this mill was planned, where it was proposed thoroughly to investigate their method. This trip was made, talked about, etc., but nothing came of it. Later on, one machine was rigged up and a test made to determine its value in our plant. Finally another dry day came which would determine the value of the method. We had a certain mix on the cards that day and it simply could not be run satisfactorily. I told the second hand to stop the cards while he went for the superintendent. On his arrival we started the cards up, and of course the trouble of static started. I then took a Pyrene can, filled it with mineral oil and sprayed the laps one by one. The electricity simply walked away from our cards. Now we hope soon to be fully equipped with the spraying system. But when the card doesn't want to go we have the medicine.

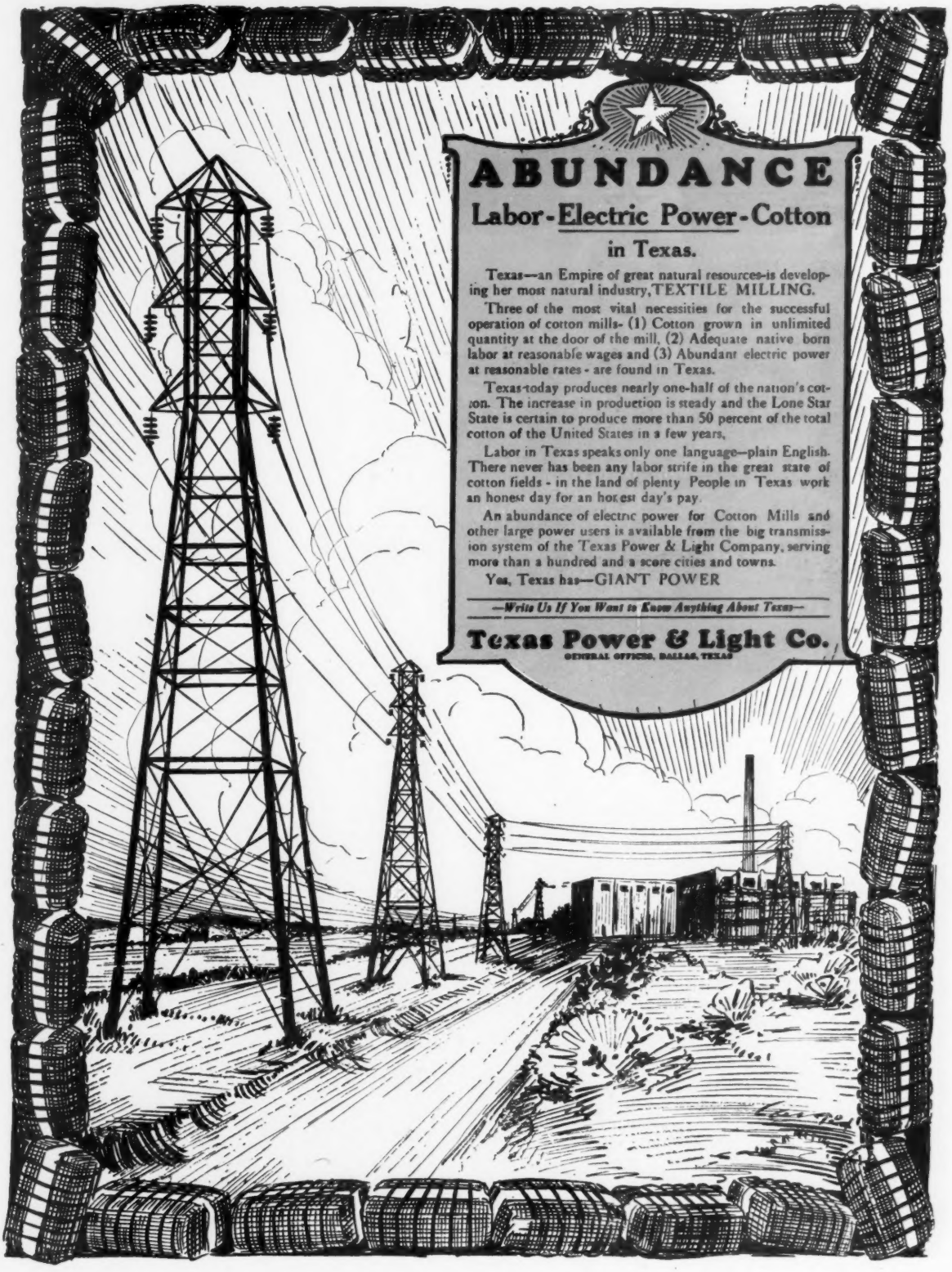
If we have a real smooth running carding department we generally have smooth running work throughout the mill. I have tried to give my mind a rest from studying so much about the problems of good manufacturing, but the further I go into the matter the more interested I become. There are still many developments to be made in cotton carding along with the other departments of the cotton mill. Frankly, I believe that cotton and wool manufacturing are in their infancy, because every day ways and means of greater production, better quality at a lower cost, etc., are being studied, and the man who is devoting his time and talent to this study, I believe, is the man most needed in our cotton industry and will be the greatest in demand because of his untiring efforts in this direction.

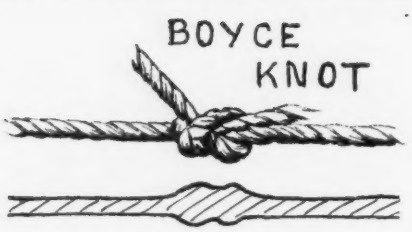
A. B. (GA.)

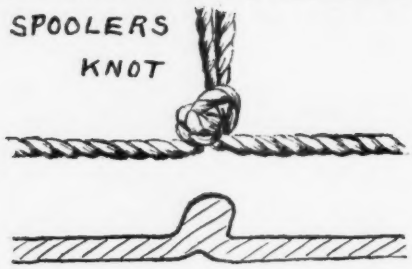
The Combing Problem.

EDITOR COTTON:

I have been much interested in COTTON and having watched particularly the discussions in reference to the comber in the "How Other Men Manage" department have come to the conclusion that this machine is the least understood of any in the preparation department. In the October issue I note an article by "M. W. H. (Mass.)" to which I sort of take exception and I believe the facts which he gives can be proven wrong. The discussion is in regard to the top comb and half lap on a Whitin comber and the amount of combing done by each on a given length of fiber. In the beginning of this article several diagrams are given to illustrate the point to be brought out, and right here the first mistake is made. To start with, the settings are wrong. It is absolutely impossible, mechanically, to set the cushion plate at 1⅝ inch and the feed roll at 1 11/16 inch. There isn't enough clearance to get as close as this,


ABUNDANCE
Labor-Electric Power-Cotton
in Texas.
Texas—an Empire of great natural resources-is developing her most natural industry, TEXTILE MILLING.
Three of the most vital necessities for the successful operation of cotton mills- (1) Cotton grown in unlimited quantity at the door of the mill, (2) Adequate native born labor at reasonable wages and (3) Abundant electric power at reasonable rates - are found in Texas.
Texas today produces nearly one-half of the nation's cotton. The increase in production is steady and the Lone Star State is certain to produce more than 50 percent of the total cotton of the United States in a few years.
Labor in Texas speaks only one language—plain English. There never has been any labor strife in the great state of cotton fields - in the land of plenty. People in Texas work an honest day for an honest day's pay.
An abundance of electric power for Cotton Mills and other large power users is available from the big transmission system of the Texas Power & Light Company, serving more than a hundred and a score cities and towns.
Yes, Texas has—GIANT POWER
—Write Us If You Want to Know Anything About Texas—
Texas Power & Light Co.
GENERAL OFFICES, DALLAS, TEXAS





WE call your attention to the two types of knots shown above—at the left, the Improved Boyce Knot, as produced by the Boyce Weavers' Knotter. The cut at the right shows the old-fashioned spooler knot. The use of this old-fashioned spooler knot has cost the cotton mills of the United States enough money in the way of lack of production, and seconds, to put a considerable stretch of cement paving in every one of the 3,014 Counties of the United States.

By adopting the BOYCE WEAVERS KNOTTER, the mills can save this profit for themselves.

Note from the illustration of the Boyce Knotter that the knots will weave right into the cloth and bury themselves, thereby being invisible It is absolutely impossible to imbed the spoolers knot into the cloth, to say nothing of the loss of production caused by spooler knots on looms and resultant inferior grade of cloth, or seconds, which show small holes in the cloth when knots are pulled out by the cloth inspector.

The illustration above does not exaggerate the proportionate scale of difference between the Boyce Weavers Knot and the Old-Fashioned Spoolers Knot.

WITHIN THE PAST WEEK WE HAVE SHIPPED 65 BOYCE WEAVERS' KNOTTERS TO ENGLAND, 172 TO CANADA, AS WELL AS FILLING ORDERS FROM 46 SOUTHERN MILLS AND 22 NEW ENGLAND MILLS. OUR SHOP IS RUNNING DAY AND NIGHT.

INCREASE YOUR WEAVE ROOM PRODUCTION, DECREASE YOUR SECONDS, IMPROVE THE CHARACTER AND QUALITY OF YOUR CLOTH BY ADOPTING THE BOYCE WEAVERS' KNOTTER.

MILL DEVICES CO., INC.

GASTONIA, N. C.

BOYCE *Weavers* KNOTTER

most settings allowing at least a difference of ⅜ of an inch between these two. Then again, a 1⅝-inch cushion plate is all wrong for 1¼-inch cotton. The waste percentage would be too high. On a Model C Whitin 1½ inch is the limit for this setting as the knife cannot be set to the half lap needles at any wider setting. So much for that.

If "M. W. H." would watch a comber comb for a few nips he would see that his theory is wrong. If he only had one single fiber to comb, the action he describes would probably take place, but in actual combing there are too many fibers side by side and a little ahead, to make his theory possible.

When the nippers open and the detaching roll bites on the tuft of cotton the fibers are stretched in as near a straight line as they can assume between the bite of the roll on the segment and the bite of the feed rolls, and not the crooked line as is shown in the diagrams by "M. W. H." This alone cuts down some of the time, from that given, for a fiber to pass through the combing process. Another thing to be considered here is the tendency the fibers have to cling together, due to their natural twist. The long fibers that are under the roller do not let go of the fibers just in back of them unless these in back are held tightly by the feed rolls, and so they move forward with the tuft.

Remember, if the nippers are open there is nothing to hold the fibers between the bite of the roll on the segment and the feed rolls. Taking this into consideration there is no accurate way of measuring just how much a fiber runs forward at each nip and no way of proving that one fiber moves forward as fast or as slow as another. But we know that fibers that were held in the nippers, protruding possibly half way, and the tail end free from the bite of the feed rolls, are pulled forward by the detaching motion, and that this tail end that was in back of the half lap needles depends on the top comb for its combing. From this it is safe to assume that 30 to 35 per cent of the combing is performed by the top comb.

Just to prove this theory and to disprove the other, take the waste percentage with a given setting. Now move the feed roll back 1/16 of an inch leaving the nipper setting the same and see the percentage of waste increase. If the fibers were held by the nippers as described by "M. W. H." the feed roll setting could not affect the waste.

T. D. P. (MASS.)

A Weave Room Problem.

EDITOR COTTON:

In answer to the question of "Contributor No. 319," as shown on page 295 of this number, with reference to a calculation on a loom driving a machine with a high-ball attached to it.

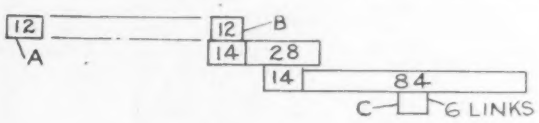
I am sending a sketch showing the train of gears as worked out according to his figures as given. *A* is the cam shaft on the loom. *B* is the chain sprocket gear on the machine. The calculation to determine the relationship between the chain drum *C*, to which the high-ball is attached, and the crank shaft, is, following the gears, as follows:

$$\frac{12 \times 14 \times 14}{12 \times 28 \times 84} = 1/12\text{th}.$$

Therefore, for each six links on the chain drum *C*, or one revolution, the cam shaft will turn 12 times, or two picks per link. This is assuming that it is a two-harness loom, which point your correspondent does not specify. On a four-harness loom, the cam shaft would turn 24 times for each six links or one revolution of the chain drum.

This answers the first question of "Contributor No. 319" as to how many picks one link will produce. As to how many picks one link will produce with a 22 pick gear, the answer is the same regardless of the number of picks, so long as the change gear remains the same.

Now, with reference to his second question as to how



many picks one link will produce with a 27 sprocket gear on the machine, I presume he refers to changing the chain sprocket *B* of 12 teeth used in the previous calculation to one of 27 teeth. The calculation on this would be:

$$\frac{27 \times 14 \times 14}{12 \times 28 \times 84} = 1/27\text{th}.$$

Thus, for each six links or one revolution on the chain drum *C*, the cam shaft will turn 27 times on a two-harness loom (or 54 times on a four-harness loom, etc.) or 9 picks per link.

Answering his final question, as to how many links will be necessary in the chain to weave one yard of cloth to each round of the chain, with a 27 sprocket on the machine and 16 picks in the cloth, there would be 576 picks per yard (that is, 16 picks per inch × 36 inches in yard) ÷ 9 picks per link = 64 links of the chain necessary to weave one yard of cloth.

This answer is assuming that "Contributor No. 319" has the idea that to change the pick gear would affect the picks per link. As explained, this is not the case, as the number of picks per link will remain the same regardless of the pick gear, so long as the change gear remains the same.

However, if he expects to use this high-ball for a marker or stripe every yard, or in fact any given distance, then the picks per inch will affect the result. In such a case, if he will multiply the picks by the distance he wishes to mark, and divide by the fixed picks per link (9 in this instance), this will give him the number of links necessary in his chain.

While it is true that the picks *per inch* will affect the distance from marker to marker, it will not affect the picks *per link* until the change gear is changed.

It is true that the number of picks between the markers will remain the same regardless of the picks per inch until the change gear is changed, but the *distance* between the markers will be changed in proportion to the picks per inch.

In other words, assuming just for illustration that it took 54 picks to give the chain drum driving the marker one revolution, with a certain change gear, then just so long as that change gear is used, the marker will act every 54 picks. Now, the pick gear may be changed. Say, again, for the sake of illustrating, that we were putting in 54 picks per yard, the marker would mark every yard. But if we changed this to put in 54 picks every two yards, then the marker would act every two yards with the same change gear being used.

S. W. C. (GA.)

Operate a dye house or bleachery?

Dye house before starting the Buffalo equipment

If you're troubled with steam in your dyehouse or bleachery, why not get information about the simple and guaranteed Buffalo method of steam removal?

Send for operating records of two plants that have saved thousands of dollars a year with this equipment.

BUFFALO FORGE CO.
460 Broadway
Buffalo, N. Y.

Same dye house. Equipment has been running 8 minutes.

"Buffalo" **air conditioning**

A Rare Combination of Advantages to Textile Manufacturers

SEARCH as you may, Mr. Manufacturer, but seldom if ever, will you find such a rare combination of advantages as are to be found in Columbia, S. C.

Every facility from an ideal location for your mill site to the adequate marketing of your finished product has been worked out in this rare combination. Each advantage materially aids the other in the economical manufacturing operation of your products.

Excellent transportation facilities consisting of four railroads operating 11 separate lines, and with two direct lines of communication to each of the six South Atlantic sea ports. Columbia is the only city in the Southeast offering such seaport connections as this. In addition, Columbia is a highway terminal, with paved highways radiating in all directions and accessible from all important points in the Middle West, the East and the Southeast.

There is an abundant supply of both skilled and unskilled labor, the majority of which is 100% American and entirely free from any radical element. There has never been a textile strike in the history of the city.

Columbia experiences extremes of neither heat nor cold—the climate maintaining an average of 63.5 degrees for the last thirty years. This assures the textile manufacturer uninterrupted operation twelve months in the year.

Sufficient power for all purposes is assured from hydro-electric plants. A new $2,000,000 steam auxiliary plant completed here guarantees continuous uninterrupted service. An additional steam plant now under construction will furnish 30,000 more horsepower. Columbia is the base of a super-power zone embracing most of South Carolina and can supply any amount of power at low cost.

The Industrial Bureau has recently acquired 1156 acres of land with many ideal industrial sites on it. This land is connected with Columbia by paved highways, a double track trolley line and three railroads. Supplied by city water, sewer connections, telephone and telegraph connections and power lines.

LABOR
An ample supply of labor—white, intelligent. Content to work for reasonable wages. Majority skilled in textile work. Plenty of unskilled labor available.

POWER
Cheap power is available from hydro-electric plants operating from nearby streams. Only one-half of the 75,000 potential H. P. is now being utilized.

TRANSPORTATION
Four railroads operating 11 separate lines offer ideal distribution facilities. Two direct connections to each of the six South Atlantic seaports.

WATER SUPPLY
An abundant and excellent water supply is furnished by the city. Various analyses show both city and branch water are applicable for bleaching and manufacture of Rayon.

CLIMATE
An ideal year 'round climate of 63.5 degrees. Heat prostrations unknown and snow is extraordinary. 10½ hours of daylight on the shortest day of the year and 14 hours on the longest.

INDUSTRIAL SITES
The Industrial Bureau keeps a file of all available sites for industrial purposes and will assist you in securing a desired location.

Write us today for further information of Columbia's wealth of advantages to the textile manufacturer.

WM. LYKES, JR., *Secretary*

COLUMBIA CHAMBER OF COMMERCE

COLUMBIA

SOUTH CAROLINA

Uneven Tension and Some Other Things.

EDITOR COTTON:

Being a subscriber to COTTON and an ardent reader of "Old Timer," and "How Other Men Manage," I feel that the time has come when I must blow off steam or burst. Some of the advice that our brother overseers pass on to one another strikes me as kind of "fishy," so to speak, but I am willing to be shown and after speaking my little piece will await the showing.

I will take for an example the good advice given to a contributor who seems to be having trouble with his fly frame tension. A brother overseer tells him to put a mile or so of calf skin on his cones and, presto, his troubles are over.

In the first place, this frame was put out by the manufacturer to run and run right, and there are but few overseers that can dictate to a shop how their machines should be built. It is a hundred to one shot that when this frame was erected in the plant the tension was o. k., likewise the rest of the frame. If the frame was all right then, why not now. Something wrong? I'll say so.

Is this poor machine scoured and overhauled systematically, the worn parts replaced, or, as I have seen when scouring, the steel rolls taken out, shined with pumice or a whitener, then put back and called done? Perhaps the gearing is way off for the hank roving. Has our brother gone through the gearing to check up the constants. Perhaps his predecessor invented a constant for his own convenience. There is also a chance that the "big fellow" in the office said we will put so much twist in the roving and then put something over via short cotton.

I take it for granted that this trouble is occurring in a white mill. If so, it would do the overseer a lot of good to come over and go through my card room. He would go back with the idea that next to heaven, his card room is the place to be.

I work in a plant, now get this first of all, that is never quiet or slack and has been that way for a good many years, so our goods must be salable. We run anything there is a profit in, draw no restrictions of any kind as to size of order or color. We will sell you one pound of Sea Island dyed black, green or pink and will use sulphur, vat, direct or basic colors, or we will supply you with one hundred thousand pounds of 2's from card strips and dye this if you wish.

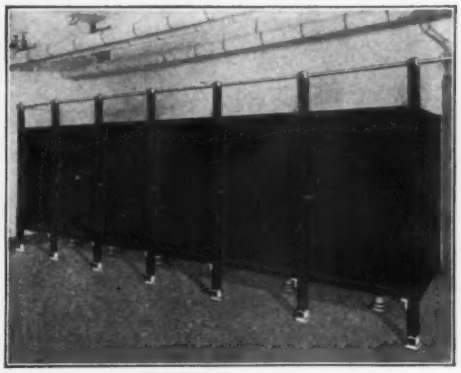
Now, that tension subject again. Time and again I am called upon to run one to five different stocks on a fly frame. Does the tension bother us? It does not. At this writing I have an intermediate running with a sulphur black double carded stock, a combed Peeler, and a single carded white. Three stocks, all different, and no trouble. The operator is on piece work and gives us a good day's production.

Some one says that we have modern machinery. We have some, but the best running pair of frames in the plant were built before 1885, and came to us third hand.

What makes work run badly? I think that about three-quarters of this so-called tension trouble is that the overseer leaves too much to his second hand. I *know*, being an overseer. Then the question arises that a good overseer, to be a good executive, should not take up a wrench and soil his hands. He is paid to use his head and let someone else do the dirty work. Well and good, but I have a tool

Craftsmanship in Metal

The Sanymetal Symbol



Typical of many mill toilet partitions.

Metal is a Stubborn Fighter

YOU know how severe are service conditions in the average mill toilet. Indifferent, slam-bang treatment may put wood partitions in a down-at-the-heels, unsanitary, unsightly condition. But *metal* will stand up and fight—hard knocks and abuse make little impression on it.

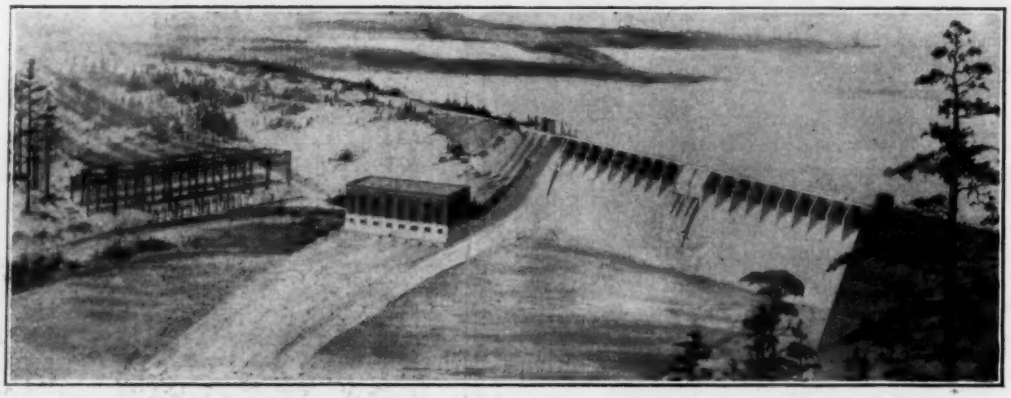
Most people, when they say metal, think of Sanymetal, which exemplifies all that is strong, staunch, and clean in the way of a metal partition.

Sanymetal Products are: Partitions for toilets, showers, dressing rooms, urinals. Partitions for office and factories. Metal doors, screens and wainscot. Sanymetal Gravity Roller Hinges for toilet doors. Write for latest Bulletins.

The Sanymetal Products Co.
1711 Urbana Rd. Cleveland, O.

TRADE MARK U.S. REG.

Sanymetal Toilet and Office PARTITIONS



The first question is—

POWER

The great Bartlett's Ferry Dam, pictured above and just being completed, eliminates the power problem from calculations of those who wish to locate manufacturing plants at Columbus, Ga. Water is now flowing over this dam, and the first unit of 40,000 h.p. will be in operation early in February. The ultimate capacity of this plant is 80,000 h.p., and its final cost over eight million dollars.

Ample power and dependable service are accepted as a fact by our customers, and this confidence is, in a measure, responsible for the vast factory enlargement program now under way at Columbus.

May we tell you more about industrial opportunities at Columbus?

Columbus Offers Industry—

Dependable hydro-electric power
Reliable native-born labor
No labor disputes or strikes
Big surplus supply of cotton
Coal, iron and timber handy
Rail and River transportation
Very low building costs
Pure, soft river water
Absolute freedom from malaria
Pure drinking water supply
Plenty of low rental houses
Efficient street transportation
Fine churches and schools
Bonds voted to pave all main roads
Friendly public sentiment
Mild winters and summers

Five Years Tax Exemption

COLUMBUS ELECTRIC & POWER CO. COLUMBUS GEORGIA

Our Power System

The power resources of the Columbus Electric & Power Company is your guarantee of uninterrupted service. They are:

Bartlett's Ferry Dam, 80,000 h.p.
Goat Rock Dam, 40,000 h.p.
North Highlands, Dam, 12,,000 h.p.
City Mills Dam, 1,200 h.p.
Eagle & Phoenix Dam, 4,000 h.p.
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—and other developments that may yet be made along the Chattahoochee rapids in the Columbus district.

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box right on the window seat in my office and know how to use the tools it contains, and never yet have I seen dust on the cover.

I worked for an overseer as second hand. One day the occasion presented itself, when working on a speeder, to ask him to raise the cone. I might as well ask him for the moon. This man was my boss, the overseer. He was a wonderful executive. He cut costs, increased production per man hour, won the respect from the powers-that-be, had the morning paper left at the mill, was the cause of the super's discharge—and then a new agent came to take charge. My boss lasted four weeks. I got his job and it cost the company fifty thousand dollars to get things back into shape—but he was a wonderful executive.

When I came to my present place of employment, there was an old S. W. P. slubber, the vintage of 1885, that was giving a lot of trouble in regard to friend tension. The second hand on the job informed me that they had always had trouble with it. The man whose shoes I had stepped into had been there fifteen years, so no doubt he knew the slubber was running badly. After watching three hands leave in my first three days, I decided that my starting point was on friend slubber. I had the second hand remove the twist gear on a modern S. L. slubber, then the one on the S. W. P. They were both the same with one constant almost twice the other. I took out about fifteen teeth of twist, bringing the turns the same and from then on the old S. W. P. runs just as good as its mate the S. L. The second hand was amazed. He drew his pay in full in about two weeks.

Sometimes, being very short tempered, I almost boil over when something like the above is brought to my attention. Here was a man who was drawing an overseer's pay, but either would not or could not fix that slubber. Just didn't care. I hired a second hand that came from as good a mill as there is in the state of Connecticut. We do considerable changing. One day I gave him the gears to change a frame from 4.00 hank to 6.00 hank. He came back in a few minutes and requested me to show him where the lay gear was. I was paying him $35.00 a week. He had worked in the card room for ten years as a fixer on all machines and came to me highly recommended. I cannot imagine an overseer running his room and not changing a lay gear, if only to see how the darn gear was put on. If he scoured and overhauled thoroughly, the lay gear would have to be brought to light.

Now, to prove that I must have a grouch on. I have worked in a few plants, one as large as any in the business—there were stock holders—treasurers that we had to sweep up for; a president, and that meant scrub all the floors in the mill; look at the agent as if he were a Greek god and if he condescended to speak, speak back; an employment manager to hire our help; a smiling welfare worker who asked you to put more twist in the roving as Mary Jones told her it needed it; if you discharged a hand the red tape involved would make you put up with a poor hand rather than go through it; and about seventeen and a half more pleasant things. Oh, yes, we could not call the spinner nor the master mechanic Joe and Jack, but Mr. Johnson and Mr. Smith. Fine! Believe me, I am fed up on this so-called industrial welfare work.

As I have said before, the plant I am now fortunate enough to be in has had to refuse orders owing to delivery. Do they pay $75 a week to some one who never saw a mill to hire a card stripper? Do they come up in my department and tell me what twist I shall put in the roving? Do they question the discharge of a drunken slubber tender? Do they insist that I call the spinner Mr.? They do not, and this plant has been running sixty years. The "super" is known by a nickname to the humblest hand.

Perhaps some brother overseer will think that I am radically wrong in my theory. Another point. I have had five second hands in two years' time, and if the sixth one I now have does not know the card room I will have another. Is it square to the employees to have a man in charge of them who does not know the machines nor the mill game? I say no. I have got as good a lot of speeder tenders as ever were under a mill roof and in order that they get the most from their machines (they are on piece work), the man who represents me in the card room must know his job or we part company.

Referring back to the plant that was next to heaven. I had the agent's son as a second hand. Could I run the department as I saw fit? No. My hands were tied. That card room was run from the dinner table when father and son got together.

I have actually worked for and taken orders on how to card cotton from a college graduate who roomed with the president's son at college. He had been turned over to me three months previous to learn the business. Being brilliant, he absorbed in three months' time that which I had spent years, not very many, to acquire. He was given the title of assistant agent and let loose to run the mill.

This same plant was running day and night for years until new ideas were had from father's sons, who came to manage it, and then we went from bad to worse. The last time I saw the plant, windows were broken, the engines were quiet, and a thousand hands had moved to new quarters.

I think I have spoken my piece and will only add that if the average overseer is let run his room as I do mine, that fly frame tensions and other troubles will soon disappear.

CONTRIBUTOR No. 4309.

Silicate of Soda in Dyeing.

EDITOR COTTON:

I recently had a discussion as to what is silicate of soda. and what it is used for in cotton colors. I thought your readers who are concerned with finishing might be interested in this subject.

Water glass, to begin with, might be either silicate of soda, or a potash, or a mixture of the two; but it is pretty certain that what is sold now is simply silicate of soda. The only adulteration to be feared in the dyehouse is the presence of iron. I have found that the water-glass ordinarily sold for the preservation of eggs is pretty free from sophistication. It probably is too cheap to make adulteration pay.

The soluble silicates of potash and soda are usually made by fusing clean quartz sand with potash, or soda, respectively; or by boiling powdered quartz in caustic alkali under pressure. Both these compounds, however prepared, must be preserved from the action of the atmosphere, especially when in a state of solution, as the carbonic acid in the air combines with the alkali and sets the silica at liberty.

The uses of these salts, especially the silicate of soda,

are various and extensive. It is now employed as a useful addition to certain kinds of soaps. For the bath of Guernsey and Nicholson blues, and pomona greens, silicate of soda is a much better ingredient than either borax or the carbonate of soda. When carefully neutralized so as to be free from all excess of alkali, it is occasionally used as a dung substitute. It is also employed, sometimes, for fixing pigment colors in printing, but the results are not satisfactory. Its use in the dyehouse depends upon its capacity for wetting out in the dyebath. Some years ago there was quite a search for wetting out mordants, as they were called. Mordant is a good word that has been loosely applied, but never more so than in this connection. Wetting out salt would be nearer the mark as it acts merely as an assistant. It does not make the slightest difference to the shade.

The cleansing action of silicate of soda is due to its alkali content, whereby it possesses the property of saponifying and removing the spinning oils and other impurities adhering to the cotton fiber. Further, the silica or silicic acid content enables them to precipitate direct or substantive dyestuffs onto and into the textile fiber. This applies more especially to goods that are dyed in the raw or unbleached condition. It is already known that silicate of soda, added to mixed fibers with sulphur colors, is a protection to the silk and woolen threads against the action of the dyestuff. About one-fourth pound of the silicate per gallon of bath and dye liquor should answer most purposes.

For dark shades of cotton dyed with direct cotton dyestuffs wetting out should take place at the boil. Glauber's salt should then be added, and finally the dyestuff. The reason for this is that the colors are sensitive to alkali. Many colors, I might say here, are wet out directly from the bale and need no silicate at all.

The treatment with silicate of soda, however, some dyers think, increases the weight of the goods and gives them a firm handle; therefore it can be used to great advantage for cheap cottons. Monopole soap may be used to restore the softness. Pure Turkey red oil tends to make the material limp. To reinforce the standing bath add about one-tenth of the original amount of silicate of soda for each fresh bath.

It is only recently that the extraordinary cleansing action of silicate of soda has been appreciated, although it has long been known as a bleaching agent for light shades if properly used; otherwise it is injurious to the fiber. This is due to the decomposition of the soluble glass and the separation of the silicic acid in crystalline form. This generally occurs in acid and hot lyes, and as a result the fibers are attacked and weakened and the goods are hardened. When the decomposition takes place in the absence of hot lyes, the silicic acid is produced in colloidal form, and is comparatively harmless. W. B. (MAINE)

A Fly Frame Problem.

EDITOR COTTON:

On page 1271 of the October, 1924, issue of COTTON, over my signature, appeared the following: "Make of frame, Providence machine. Change compound pinion from 16 to 14 teeth. What changes should be made to make conditions equal, and what effect does the change make in the lateral movement of the cone belt, and also the working area of the cones? This should be an easy one for anybody who understands the fundamental principles underlying the successful operation of a roving frame."

It was my desire to have "H. H. Y." work out the foregoing by equation, but he has to date failed to answer.

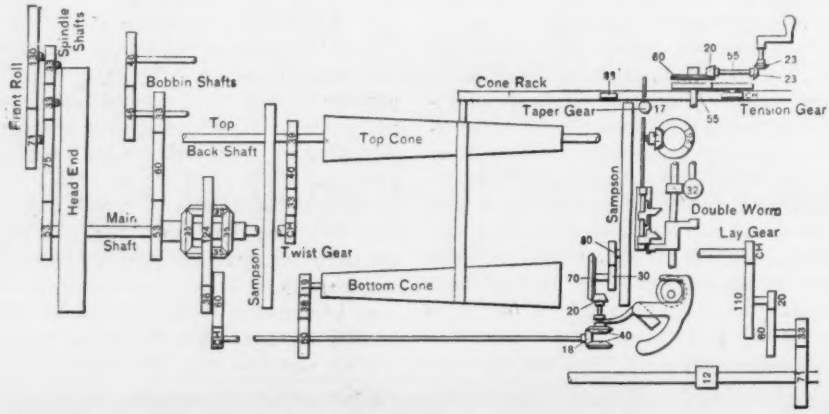
In the December issue of COTTON, on page 165, "Experience" says that "I think 'Wash' might just as well bury the hatchet and call the flyer-lead system gone forever, for we don't need it in the mill business today."

"Experience" is no doubt one of these fellows who are still looking for the cause of uneven yarn and roving.

In the November issue of COTTON, "J. L. (Mass.)" copies "H. H. Y." and his parabolic curve. In the January, 1925, issue, I asked "J. L." to enlighten me on the following: "Let us assume that owing to a radical change in the hank roving we are forced to change the compound pinion from 20 to 18. This, you must admit, would reduce the speed of the bobbin, and would also cause a necessarily smaller lateral movement of the rack at each completion of the carriage. What effect does the foregoing change have on the parabolic curves of the cones?"

Up to the present time, that question remains unanswered.

The readers of this department will remember that I was once accused of having bad dreams, etc. In this present article I am going to try to learn how much these defenders of the bobbin-lead system know about fly frames. Please be reminded that I have answered every question put



to me since my first letter in the year 1913. Now it is only fair that these critics should answer my logic, or else bury the hatchet.

The change in system was caused simply by the fact that those who championed the bobbin-lead system had more mouth and influence than ingenuity.

If "Experience" and the other defenders of the bobbin-lead system will dope out the following, and prove that they understand the fundamental principles underlying the successful operation of the fly frame, I promise them to bury the hatchet forever.

Referring to the accompanying drawing, we change the change gear marked CH from 32 to 20 teeth. This change brings the cone belt at the extreme end of the bottom cone at the start of the set. With this change we find that the tension is slack, and must be tightened about every fourth layer until the cone belt is at a point say about four inches from the starting point. To overcome this, we change the bottom cone gear from 19 to 24, which allows the cone belt to start about 3½ inches from the end of the bottom cone and overcome the slackness mentioned at the start of the set. However, at the finish of the set we find we have only a very small bobbin. Slightly over one-half set. The taper increased about one-half. Now, what causes the foregoing?

Remember, the rack, lay or taper gears are not changed.

The frame is a Saco-Lowell flyframe. Change as stated, and you get the results as mentioned.

What causes the increased taper and smallness of the bobbin?

If the defenders of the bobbin-lead can't explain, just let them ask "Uncle Wash," and I'll do it, without using the word parabolic.

WASH (R. I.)

Spinning Fine Yarns.

EDITOR COTTON:

I am going to present in this letter my idea of what a mill must have and what must be done to produce a good fine yarn. In the first place is the selecting of the cotton. In this class of work it is more necessary to exercise care than for ordinary numbers or coarse work. If possible, the bales should be selected which have a very uniform length of staple. These should be mixed well so as to get a portion from many bales in each armful. When the cotton is started through the opener it should be examined closely to see if it is curled as it leaves the feed roll. If it is there will certainly be trouble in the other processes to follow. To prevent it from being curled and knotted the beater speed should be reduced to about 1,200 revolutions per minute, at the same time keeping up the same fan speed. The cages, the screens and the dust flues must be kept cleaned to keep the draft open well at all times. If anything seems to be going wrong the machine should be stopped and the trouble located before it is started. If this is not done there will surely be trouble in the succeeding processes.

Next comes the picker. The intermediate picker should not be used, as long staple cotton will not stand the same amount of beating as ordinary cotton. In order to make this clear we will examine into the process a little more closely. Suppose we are running 1⅛-inch staple cotton and that the beater is running 1,500 revolutions per minute, there being two blades on the beater, the cotton would be

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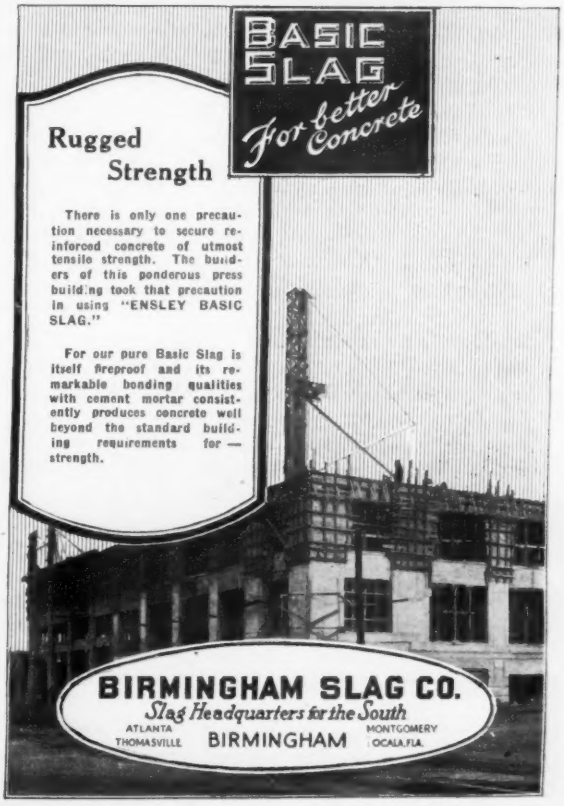

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struck 3,000 times. In the meantime, the feed roller which is 2 inches in diameter has turned 21 times and has delivered 132 inches to the beater. Thus each inch has been struck 3,000 ÷ 132 = 22.7 blows. If the cotton was 1-inch staple each fiber would be struck on an average of 22.7 times, but as it is 1⅛ inch it will be struck 25.5 times. A similar calculation will show that for 1¼-inch cotton each fiber will be struck 39.7 times. This is more than long staple cotton will stand. A great many of the fibers will be broken and many more will be curled. For this reason we must not only omit the intermediate picker but also we must reduce the speed of the finisher to about 1,200 revolutions. As in the opener, the speed of the fan must not be reduced and extra care must be taken to maintain a free draft. If this is not done the cotton will be curled. If, however, the speed of the fan is too great, the selvages will be bad. This will not work well, and I know of a mill which put in new sides for the lap head and for the table thinking that by reducing the space they would get more even selvages. All the machines needed was to have the cages and screens and dust boxes thoroughly cleaned. This should be attended to twice every day.

And now we come to the cards. In order to get good carding, the clothing should be of the best quality, fine wire and a good many points to the inch. If the mill is a new one and built especially for fine work, the builders should see that the card has the proper clothing. The cylinders should be run about 130 r.p.m. instead of 165, as for ordinary work. The doffer should not run over eight turns per minute. The speed of the licker-in should be reduced to 350. The feed roll should be drawn off to make it accommodate the long cotton. If this is not done some of the cotton will be knotted and it will be impossible to straighten it out again. The cards should be very carefully ground, and ground often, but not too long at a time. They should be stripped about three times a day, but they should not all be stripped at one time—first every other one, then in about an hour the rest should be stripped. The help would not like this, but, nevertheless, it makes more even work. Everything must be kept clean, and occasionally the screens should be taken out and polished.

The next process is the drawing frames. The only items which deserve special mention are those which would naturally be noticed by a good overseer. The trumpets should be especially noticed. If the work has been coarse the trumpets will be too long for long staple cotton. The writer was once called upon to examine a card room where there was considerable complaint on account of cut drawing. It was suggested that new trumpets be put in, and soon after everything was satisfactory. As the rollers are farther apart than in coarse work the clearer waste must be removed much more frequently or it will fall down between the rollers and cause bad work. Now for the twist for fine work. One great trouble many mills have is excessive twist in the roving, especially where there is combed work. Ordinarily the twist of roving is 1.2 times the square root of the number. In no case should more twist be put in than is absolutely necessary to turn the bobbin in the spinning frame.

As to speeders, in changing from coarse to fine work it is sometimes found that the noses of the flyers and the fingers of the pressers are too large. When good fine yarn is wanted these must be changed. Occasionally the front roller should be disconnected by removing the twist gear, and the nose of each flyer thoroughly polished with emery cloth while the spindles are running full speed. The top rollers must be more carefully covered than for ordinary work and the leather must be put on a firmer foundation. As the thread or roving is very small in diameter there must be very little cushion in the roller or the weight will be taken entirely off the stock, and for the same reason, the roving traverse motion should be carefully looked after. It should never be allowed to stand still and should traverse within ⅛ of an inch of the end of the roller. In one case the writer had a double thread put on the worm which drives this motion, and that would cause the traverse to move twice as fast, the results were so satisfactory that the whole room was changed.

Now the tension is another thing that should be looked after and should have special care. A speeder will run if the ends are too tight, but the results will be dangerous to the roving and yarn. I have known speeders to run bad for days, when all that was needed was a clean cone belt. The cone belt and cones should be well looked after on fine work. The stock is so delicate that very little things often cause a great deal of trouble.

Creeling the roving is another matter in connection with speeders which often escapes attention. For fine work, in order to keep the number even, it is necessary to run one large and one small bobbin together. There is a slight difference in the number of roving on a small and large bobbin and a great difference in the amount of tension necessary to turn them. The writer once had some trouble in getting the numbers even on 80s and 100s and finally changed a pair of speeders to this method of creeling and in a few days it was noticed that these speeders ran better than the others and all the speeder hands wanted their machines changed also. This has about the same effect as running bobbins from the front and back row of spindles together, as is done in some mills.

Another matter which has considerable bearing on the evenness of numbers is to look well after spare roving. I once had some nine-hank roving piled on the floor, where it remained several weeks. It was afterward sized and it was very nearly eleven hank. Investigation showed that the moisture had dried out until the outside layers were much lighter than those underneath. Spare roving should be kept out of the sunlight and kept in well covered bins.

One of the greatest features in a fine spinning mill which should always be observed is to have everything as clean as possible. Of course it is much easier to keep a fine mill clean than a coarse one, and it is also more necessary. In many mills it is necessary to cover the machinery when the ceiling is swept down, and the pulleys are not brushed out with a broom but are carefully wiped out by hand when the mill is stopped.

Now the ideas given in this article are what I consider proper for a mill spinning fine yarn, but of course I don't mean to say that we can have quite everything as it should be, because we cannot always get just what we want to do work with. The first thing that would offset our plans would be the selecting of cotton. That seems to be the main trouble nowadays, but the head of the mill usually expects just as good results from poor cotton. We may be able to select good cotton all right, but the next thing is to get it after the selecting has been done.

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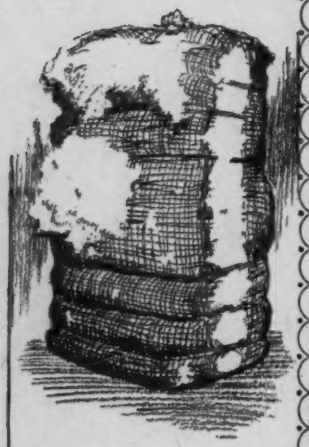

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Many things that this article contains can be accomplished without much expense or trouble to the mill manager, and that means a whole lot to many of them. Most of them will say go ahead and do anything you want to, but don't forget to keep the cost down. It surely does not cost much to be particular and keep things clean at all times and to keep the machinery in proper condition so as to produce good work.

EXPERIENCE (CONN.)

Rules for Spur Gears.

EDITOR COTTON:

In regard to the discussion going on about spur gearing and changing pitch of gears, I would like to submit a few formulas or rules used by some of the prominent machine manufacturers.

First:—to find the pitch of a spur gear, divide the number of teeth in the gear + 2, by the outside diameter; or:—divide the number of teeth in the gear by the pitch diameter. The first method seems to be the most practical because the pitch circle is only an imaginary line, drawn nearly half way down on the tooth.

The pitch, or, to be more exact, the diametrical pitch, refers to the number of teeth for each inch of pitch diameter. The circular pitch is the distance from center to center of any two adjacent teeth along the pitch circle. This can be found by multiplying the pitch diameter by 3.1416 and dividing the product by the number of teeth in the gear.

To find the pitch diameter, divide the number of teeth in the gear by the pitch.

The foregoing rules are a few of many used in the theoretical design of spur gearing, but I think the rules mentioned can be found useful around any mill. Many others could be submitted, provided the demand warranted such.

H. D. (MASS.)

A Job for the Textile Graduate.

EDITOR COTTON:

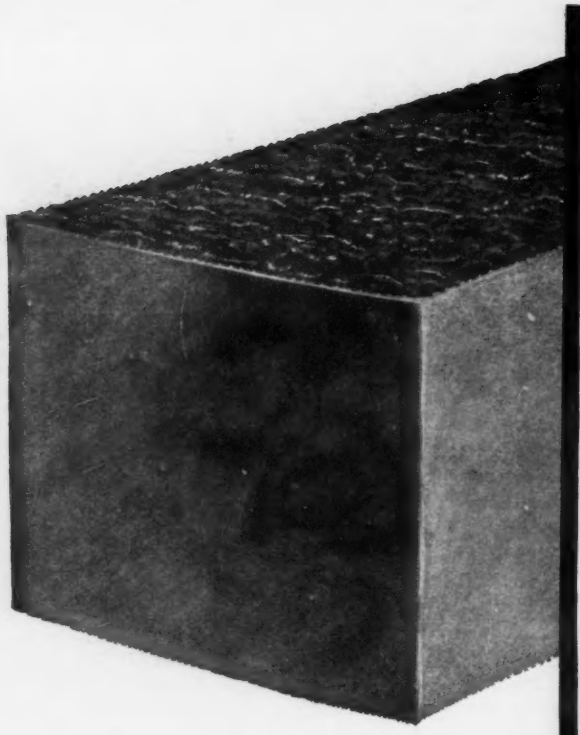
Back when our pioneer mothers sat for hours at the spinning wheel, spinning the yarns from which they wove the clothing for the entire family, little did they realize the tremendous strides the infant industry was to make over such a short period of time; nor did they realize that the development of the textile industry was to cause so great a change in society. Never-the-less, with the change from the domestic program to the modern program of efficient textile plants in tremendous numbers we find that a surprising change has taken place in society. This change is far more noticeable in some localities than others.

I have found that a sort of nervous dissatisfaction is often prevalent among many in the average mill section. There must be a reason for this trait. To solve this problem we have only to look for the thing which dominates the major portion of their time. This is invariably true in the analysis of any social condition. We may immediately think it is the machines of which they are the constant operatives from day in to day out. Machinery is cold and constant in its operation to the one who is compelled to stay right at it from day to day and at times not even understand its simplest operations. This tendency may be just as surely developed in the individual as the habits of eating, drinking and sleeping. It is a part of nature's process that human organisms shall respond to these stimuli. But after all is this thing to be ridiculed? Some say it is environment that effects this change. The thing to do then is to better the conditions underlying these environmental effects.

Technical education is making a wonderful contribution to this cause where night schools have been established in the cotton mill communities. The Smith-Hughes Act provides that the government will assume one-half the expenses of these night schools, and in this way cooperates with the different industrial concerns in their programs of industrial education. This program to me seems to be the only logical solution of the problem which confronts us. Some may disagree with me as to the percentage of efficiency of employees after having received a technical course as provided by the community night school and similar courses of instruction. For years the brains of the country have been utilized in increasing the efficiency of mill machinery, and now the question arises, "Are we placing 100 per cent efficient machinery in the hands of operatives who are only about 30 per cent efficient?"

It is not a difficult thing to convince the mill owner that an employee who understands his machine and who has developed his mentality so that he can reason, is more competent and valuable to the mill than an employee who only knows how to operate his machine. But the thing which sometimes seems to glare into his face to the absolute exclusion of all other reasons is that after an employee has been trained at the expense of the mill he will leave to accept more money with some other mill. But right here I am sure that we will agree that this is a bad policy. It is just exactly like the old argument concerning the education of the negro, that is, that after he is educated he will become a menace to the white people. Of course such "tommy rot" as this has no foundation. Suppose a mill, through a night school, trains a man to be a better, more efficient employee and this employee is offered a higher wage by some other mill; the mill loses a good man it is true, but his education only costs them a few dollars and they will gain by it in the long run. This man's success will set a precedent that a number of other employees will attempt to follow. In this way sooner or later, the efficiency of the entire organization will be raised.

This long needed educational program can be promoted and made a success in cotton mill society only by the combined efforts of the intellectual group of mill men. It is not, however, my purpose to convey the idea that practically all the laborers in the mill are ignorant. This is by no means true. We will be able to find many belonging to this class who will be wonderful instruments in the propagation of this program. But the success of it depends largely upon the men who are to be the future overseers, superintendents and owners. Graduates of textile schools are without a doubt, destined to become a part of this group. They will not only know how to accomplish results in their work according to the best technical methods of today, but they will be able to impart to the less intellectual operatives that knowledge which will enable them to become a stronger link in the chain of industry. It is through the establishment of schools of technical education in the communities that this may be accomplished. It remains as a challenge



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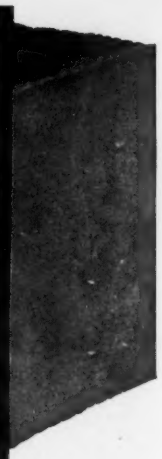


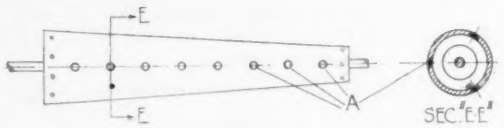
to textile students, to those who will *make* or *break* the standards of that society of which we are so much concerned, and upon whom depends the textile industry of the years to come. M. R. H. (N. C.)

Overcoming Uneven Tension on Fly Frames.

EDITOR COTTON:

In looking over the "How Other Men Manage" department of the November number of COTTON my attention was drawn to the letter from "G. D. S. (S. C.)" and to the trouble he is having with his frame. This is an old type of frame which he is using, not many of which are now in use in the South. However, I will give him a remedy for getting regular tension on these frames, or on any other make for that matter.

To begin with, the top and bottom cones must be in perfect line. Sometimes the top cone may slip and the fixers will tighten the set screws but fail to line the cones, and a frame in this condition can never be made to run a full set of roving without the tender letting off or taking up the rack. As the belts are narrower there is a considerable load to pull, and at their best there is a great deal of slipping, especially in hot, dry weather. In order to overcome this slipping I would suggest that the cones be taken to the shop and that small holes be drilled in them about six inches apart and three lines to the cone, as shown in the sketch, after which wooden plugs should be driven in the holes, scattering them across the face of each cone. Then some fine emery cloth should be used to break the polished surface of the cones; a good grade of glue should be secured and a narrow thin belting, say ¾ of an inch wide, wound on the cones the same as on a doffer fillet, using the plugged holes to tack it on. Be sure the iron cone is warm before starting to glue the belting on, otherwise the glue will chill and peel off. After both cones have been finished and the glue is set up, place the cones in a lathe and sandpaper them smooth. It will then be found that there is a surface on the cones which will prevent the slipping of the cone belt. If the bottom cone gear is the proper size to suit the diameter of the bobbins, set after set can be run, the tension wheel of course having the proper number of teeth for the hank roving being made.



This was handed down by a master carder who served his employers thirty-three years, and the writer has been guided by this man's teachings to a great extent for the past thirty-five years.

I trust that this explanation will be of some help to "G. D. S." in his future undertakings. I am glad to help to the extent of my knowledge. O. T. (N. C.)

Uneven Tensions on Fly Frames.

EDITOR COTTON:

In the November issue of COTTON I see where "G. D. S. (S. C.)" sends us a vote of thanks. I suppose I am included. He concludes his article by reminding us that his frames are old model Woonsocket and Pettee makes. Now just think of it, after those frames have run all these years, running tight at the start then too loose, until about an hour before the doff (not considering the number of hank), then too tight. After all these years he has discovered that the cones were defective, but did not know until "T. A. D." made the suggestion.

What I should like for "G. D. S." to tell us is why he or any one let such a condition exist all these years without seeking information?

Now, after covering the cones in the manner suggested, he states that his troubles are all over, which sounds like the long draft in the cards.

Please be reminded that this case of "G. D. S." is very strange, because although the cones were defective, in his inquiry he stated that during periods of favorable weather his work ran as well as anybody's. So the readers of this department have learned something indeed. From this letter we now know that favorable weather will remedy defective cones. This is great stuff!

Next, in the same issue on page 59, we find an article entitled "Changing the Pitch on Gears" and written by "C. C. (N. J.)," This is a case of the blind leading the blind. Read the third paragraph, in which he states, "If those frames were equipped with the wrong gears could they possibly run properly at any time? The weather has a great deal of effect on cotton we all know, but I have never heard of a train of cast iron gears that could be influenced by climatic conditions." But did I make such a claim? Even if I had, the reasoning was as sound as that claiming that climatic conditions remedied the defective cones in this same case.

In the fourth paragraph "C. C." states: "It is plainly evident that 'Wash' has very little knowledge of spur gear tooth calculations when he says 'the pitch of the train of gears driving the bobbins was changed at some time or other and the compound pinion changed to make up the difference between a small and a large tooth, or vice versa.'" Continuing in the next paragraph he states: "Now as the train of gears forming the bobbin drive rotate about a fixed center (that is, not being on an adjustable arm, or other movable device) it would be a somewhat difficult matter to change the pitch of gears under such a condition insofar as securing a proper mesh is concerned. I was at one time a machine designer, so that I can fully appreciate just what difficulties would have to be overcome."

As we are discussing old frames let us consider that we change the bell gear on any old Saco water power frame from 70 teeth to 53 and the back bobbin shaft gear from 44 to 33 teeth. Now I will ask, what change must be made to obtain the proper tension?

There is a moral to the foregoing, which is, don't change the pitch of the train of gears driving the bobbins without changing the train driving the spindles. Get the point?

"C. C." concludes his article by stating: "My only object in presenting the foregoing was to endeavor to bring out the point that it was hardly likely that an attempt to change the pitch of the gears on those frames had ever been made." "C. C." is wrong. The writer is considered an expert, and is called on every little while to help straighten out mills where blunders have been made. Not long ago he was called to a mill where the gears had been changed on the fly frames, that is, the bell gear was changed from 70 to 53 and the bobbin shaft gear from 44 to 33. There

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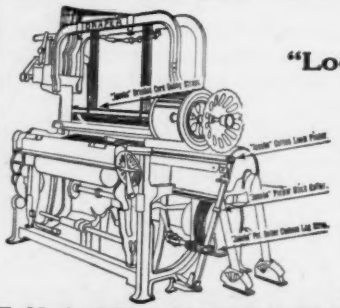

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were several changes that had to be made which I will describe after we hear from our friend "C. C." and others.

WASH (R. I.)

Keeping Down Waste.

EDITOR COTTON:

The problem of keeping down waste has always been a hard task in the cotton mills. Every mill man is familiar with its importance, but few keep an accurate check on the waste made which is necessary to keep it down. To do this one must check on each operator by putting a waste box or bag by each machine, and then weighing the waste made each day. A report should be made of this waste and placed on a bulletin board where all operators can see it. At the end of the week each operator's waste should be totaled and a grading system used giving the operator with the least waste a mark of "very good." The other markings should be "good," "fair," "poor" and "very poor," according to the amount of waste made. If these grades are posted each operator will strive for a good grade in order to have less waste than his fellow-workers. If a worker does not strive to get a good grade he is not interested in his work and should be discharged, unless the overseer is able to show the individual how to eliminate some of his waste.

If it is a picker hand investigate and see if the waste made is due to the breaking out of small laps or by mere inattention to his work.

In case of a card hand the trouble may come from letting the laps run out, or letting the ends down. Of course, the machine might be out of order, if this is the case it should be reported to the section hand and repaired at once.

If the drawing frame operator makes too much waste, first see that the machine is in good mechanical condition. If the trouble is not there, then see that the operator is not wasting too much roving in setting in full cans. He should be careful, too, in splicing ends, so that there will be little waste made.

The slubber operator should see that the ends that come down on the drawing frames are spliced properly, and that his frames are in good mechanical condition and do not run over or under. Worn flyers, spindles, bolsters, and steps cause tangled work which in turn makes waste. Several other mechanical defects cause bad work and waste on frames. The slubber hand should stay close at his work in order that he may stop his frames when an end comes down without breaking down a whole stand of ends, thus causing more waste. Care must also be taken in creeling on slubbers to splice together all roving left in cans, and to run same.

On intermediates, speeders and fine frames, see first that the frames are in good mechanical condition. The overseer should see that the slubber hand does not make hard ends in putting up broken ends, also that in creeling the operator does not break out bobbins with too much roving on them, if it is necessary to break out pieces: have these used at the end of the frames on a few spindles. If proper attention is given the operator must stay close to the frames at all times.

In the spinning room waste should be held down in the same manner as in the carding room. A bag or box should

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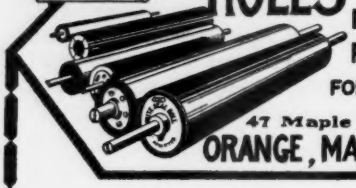

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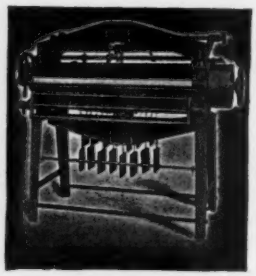

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be placed at the end of the frames where all waste can be placed and a record of same kept, as in the other room. No bobbin with roving on it should be taken out of the creel until part of the bobbin shows. Waste may be reduced by this method, for many spinners take the bobbins out with too much roving on them. All bobbins that will not unwind are sent back to the card room so that the cause for same may be removed. In the spinning room it is very necessary, as in all rooms, to keep the white waste off of the floor.

At the spoolers a "piece hand" is kept whose duty it is to run up all pieces and tangled work. A weekly record is kept of the waste made by the "piece hand" in order to prevent the hand from cutting off too much yarn. The frames must be kept in good condition. Lard oil is good for preventing stuck rods, which is one of the main troubles on spoolers.

A waste record of warpers is kept of each operator's work, which shows the number of laps made, and all short and long beams. The bad run-outs in each set of beams is shown to the warper tender by the overseer, who in turn determines the fault, whether mechanical or operator's.

When having a bad run-out on the slasher, this waste can be made into twine for sewing burlap on bales. A tape used on the warp in back of cylinders in starting new sets, keeps down waste. Tying on the new set in smaller bunches reduces the amount of waste in getting it straight. An apron is used on all loom beams to reduce the amount of warp waste in the weave room.

A waste record is kept of each loom fixer in order to see that no warps are cut out before they are due to be taken out. All filling waste is rewound on a quiller, except very small pieces which are cut off.

In the cloth room a close check is kept on waste made and held to a minimum by the overseer who determines which pieces are necessary to be cut out.

If this system of holding down waste is used and a constant check is kept it will be surprising how the amount of waste can be reduced. No operator will strive to keep from making waste unless a close check is kept of his work, and at no time have we ever caught an operator carrying home waste. CONTRIBUTOR 812.

A Weave Room Problem.

EDITOR COTTON:

I have a problem which I should like very much to have some help on through the pages of COTTON.

On the cam shaft is a chain sprocket with 12 teeth, driving a machine attached to the loom, having a chain sprocket with twelve teeth. Attached to this sprocket is a gear with 14 teeth that drives a gear with 28 teeth. Attached to this gear is a gear with 14 teeth that drives a gear with 84 teeth. Attached to this gear is a chain cylinder or drum. A chain run on this cylinder or drum has six teeth, or six links of chain will go around it. How many picks will one link produce? How many picks will one of these links put in the cloth with a 22 pick gear on the loom or 22 picks in the cloth? And how many picks will one link put in the cloth with a 27 sprocket on the machine and 16 picks in the cloth, or otherwise, this chain drum has a chain that has a high ball on it and this with a 27 sprocket on the machine and 16 picks in the cloth, how many links will have to be in this chain to weave one yard of cloth

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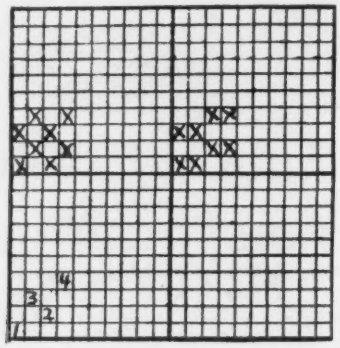
CONTRIBUTOR No. 319.

An Example in Cloth Analysis.

EDITOR COTTON:

Following the publication of my article on cotton cloth calculations on page 341 of the February, 1925, issue, and my second article on cotton cloth analysis on page 893 of the July, 1925, issue of COTTON, I received from a reader of COTTON a small swatch of a finished poplin of which he desired an analysis. This, he said, was to be 30-inch grey cloth. He also adds, "Suppose I receive a piece of finished cloth to analyze. Our mill being a grey mill, I am to re-



produce it to a given grey width. I am not told the finished width. Can you tell me what you consider the right way to do this?"

I am at a loss to understand why this man should not be given the grey width of his sample. At least he should have been furnished with the finished width. Selling houses usually give the sley, pick, width, and yards per pound of the grey cloth. However, I have analyzed the sample of poplin, assuming that it is to finish three-quarter, or 27 inches wide inside selvages.

Thus, the sley of the grey cloth is:

$$\frac{27 \times 100}{30} = 90$$

Similarly, the pick of the grey cloth is:

$$\frac{38 \times 100}{90} = 42 \text{ (practically)}$$

As indicated, I am sending you in the accompanying table and drawing the analysis of this poplin sample, together with the necessary data for reproduction in a 30-inch grey width. I thought it would interest your readers as an example of the process of analysis described and explained in my previous article.

ARTHUR H. DICK.

CLOTH ANALYSIS SHEET.

Fabric: Poplin (Finished) Date: Nov. 13, 1925.

Data: 1 sq. in. = ... 1.16 grains
Sley: 100 = ... .755 grains
Pick: 38 = ... .415 grains
Width within selvages ..... 27 inches
Add to width for selvages..... .32 inch = 64 ends
Warp contraction ..... 5 per cent
Filling contraction ..... 9 per cent
Remarks: Body of cloth reeded 2 per dent.
Selvages reeded 4 per dent.
Warp pattern: White.
Filling pattern: White.
Weight of one yard of cloth, including selvages: 2.607 oz.
Total number of ends in warp: 2764.
Patterns in warp: None.
Counts of warp: 32.195s.
Counts of filling: 23.104s.
Weight of warp, including selvages, in one yard of cloth: 1.717 ounces.
Weight of filling in one yard of cloth: .896 ounces.
Yards per pound: 6.123.

GREY CLOTH DATA.

Ends in warp: 2764.
Sley: 90.
Pick: 42.
Width within selvages: 30 in. Add for selvages: .355 in. = 64 ends.
Counts of warp: 32s.
Counts of filling: 23s.
Width at reed: 33.087 inches.
Reed number: 41s (41.285 dents per inch.)
Weight of warp, including selvages, in one yard of cloth: 1.727 ounces.
Weight of filling in one yard of cloth: 1.205 ounces.
Yards per pound: 5.456.
Weave and drafts: (Shown on design paper.)

A Suggestion on Cork Rolls.

EDITOR COTTON:

It would be interesting to know if "J. U. (R. I.)" is referring to a thin wrapped cork cot or a thick seamless one in his letter in your October issue. If he is using a wrapped one, it is quite possible he would find some difficulty with the cork chipping out. On the other hand, if he is using a thick seamless cork cot in which the compression of the cork in the manufacturing process is at right angles to the working surface of the cot, I believe he would not have that difficulty. My suggestion would be that "J. U." get in touch with the manufacturers of seamless cork cots and secure from them a sufficient quantity to equip part of a frame and run a comparative test between the thick seamless and thin wrapped cots. I feel quite sure he will find that the thick seamless cork cots will give him excellent results. J. W. Y. (PA.)

Finding the Pitch of Spur Gears.

EDITOR COTTON:

In the November number of COTTON I noticed a letter from "C. C. (N. J.)" in which he makes the following statement: "The rule to find the pitch, or properly the diametral pitch of a spur gear is, divide the number of teeth in the gear by the outside diameter of the gear."

I would like to make a correction to the foregoing statement, namely, that—To find the pitch of a spur gear, divide the number of teeth in the gear + 2, by the outside diameter of the gear.

There have been several instances in textile machinery design where a desired number of teeth have been cut in a blank, theoretically correct of a different number of teeth. Of course this is done within reasonable limits. Such gears are usually named mongrel gears.

And so I can readily see where "Wash" maybe has the right idea.

H. D. (MASS.)

Knitting Section

In step with the market

B-Vertical Floating Striping Machine

B-Vertical Floating Striper and Dot Machine

*B-6 Machine

*B-7 Machine

THESE machines offer a variety of styles and colors to meet all demands.

Simple patterns may be produced on these machines as well as the more comprehensive styles containing a multiplicity of colors, checks, dots, etc., incorporating in one machine the advantages of all these desirable features.

*Models B-6 and B-7

These machines are built with six and seven yarn feeding fingers, respectively. These machines are of floating vertical stripe design.

The vertical stripes are produced by groups of knitting needles knitting with one or two yarns used for plaiting, thus producing a perfectly clear and positive vertical stripe of a greater width than can be produced with reverse plaiting needles, particularly when using worsteds or soft yarns on coarser gauges.

The vertical stripes can be located throughout the circumference of the stocking as desired, by the use of jacks under the needles to produce the vertical stripe of the width desired.

These machines will produce repeated horizontal stripe patterns of any design up to 48 courses, if two or more course width stripes are desired. Repeated patterns up to 24 courses can be made if single course stripes are incorporated in the pattern.

The vertical striping attachment on these machines is so arranged that when making plaids or checked patterns small squares can be inserted in the middle of the check or vertical stripe.

The above machines can be set up for either men's half hose or ladies' hose, if desired.

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80,000 SPINDLES

QUISSETT MEANS QUALITY

We invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packing and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

A Pencil for Marking Underwear Roll Ends.

EDITOR COTTON:

In our underwear knitting department we have recently instituted a little "kink" which may be of interest to your readers.

Up until a few weeks ago we used the familiar method of stenciling to mark the ends of rolls of tubing as they are cut from the knitting machine, for identification throughout the remainder of the processes. We have always disliked this since the stencil ink would smear onto other rolls, and, also, this method was awkward and required a lot of time.

We now have made a simple little table, about three feet high, with a square top about ten inches wide, which is covered with emery cloth or board. The man who marks the rolls takes this to the machine, cuts the tubing, and uses a No. 245 Eagle pencil, with large lead, to mark the number of the machine, knitter, etc., on the ends of the roll. This does away with the smearing of the ink, and is much easier for the operative. The emery board covering is used so the fabric will not slip while he is doing the marking.

We found that this pencil marking would hold through the finishing processes, and have adopted this practice. I recommend it to the underwear mill men who read "Knitting Kinks." And if any of them has another way of doing this which he feels is better, we would be glad to have him describe it for the rest of us. T. F. (TENN.)

Using and Adjusting a Model K Machine.

EDITOR, COTTON:

This, the concluding article of this series, will continue the discussion of common difficulties arising in the operation of the Model K Scott & Williams knitting machines, and how to remedy them, on which three articles have already been published.

Drop Stitches.

Drop stitches in the gore may be caused by (1) insufficient friction on the needle; (2) needle with the spoon of the latch worn, lying too flat against the hook and not allowing the brush to open the latch; (3) needle being out of line when on the heel and toe; and (4) the center cam not drawing the needles down soon enough, allowing the latches to fly closed in the right corner of the throat plate. The remedies are obvious, being to tighten, change or straighten the needle; or to put in a new center cam which will draw the needle down sooner.

Drop stitches on the large butt needle side in the foot are generally caused by the high splicing cam drawing the long butt needles down too low, allowing the thread to bound over the hook of the needle. The high splicing cam should be readjusted so that it does not draw the long butt needles down so low. Care must be taken not to let the long butt needles up too high, as this will cause the splicing thread to get caught on the hooks of the long butt needles, which will throw the splicing off.

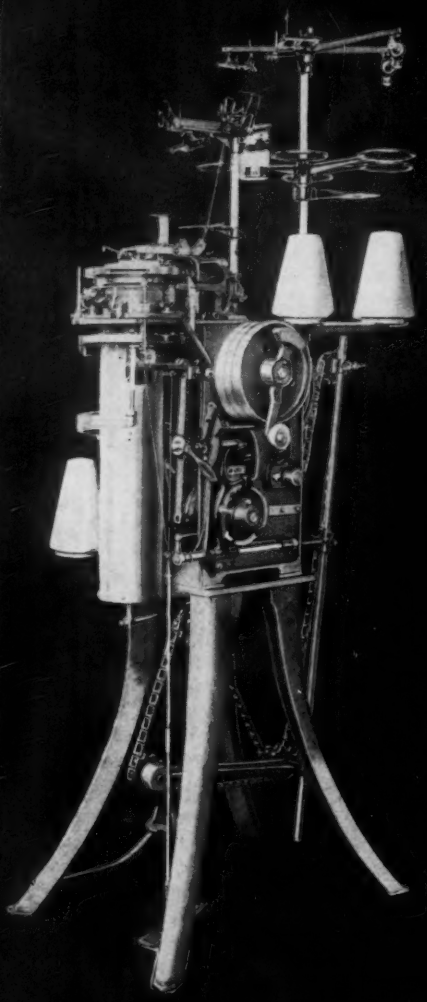
Or, if a needle does not have enough friction, as it is being drawn down, it will bound down further than those with friction, causing the thread to bound over the hook of the needle. More friction, of course, should be applied.

If the drop stitch trouble develops in and outside of the hem, it may be caused by the high splicing cam being in, drawing down the long butt needles. The dividing cam should be in only when on the splicing. If this is the trouble, the set screw on the high splicing cam should be adjusted so that it just clears the long butt needles. A needle out of line or with insufficient tension will also cause drop stitches at this point.

Drop stitches appearing in various parts of the stocking are most always caused by the center cam not drawing the needles down soon enough, allowing the latches to fly closed in the right corner of the throat plate. A remedy is to try, first, knocking the bracket to the right to which the center cam is screwed. If this does not stop the trouble, the center cam should be changed. Also, too steep a stitch cam will cause the needles to bound down too quickly. A new stitch cam should be substituted.

Should the trouble of drop stitches occur on the looper line, it is probably due to a needle being out of line or not having enough friction, too plain a looper line, brush, or the latch ring not being closed.

Returning to this trouble in the gore, if there was not some means of closing the gap in the throat plate as the machine goes into the heel and toe, the latches of the needles would get caught or close in the corners of the throat plate. It is the purpose of the gap closing ring to close the gap when on the heel and toe. If it is not closed when



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on the heel and toe, the adjusting plate on the gap closer bar should be properly set. Care must be taken not to get the gap ring in too far, because as the machine goes into the foot, the left end of the gap ring will project into the gap, not allowing the splicing finger to drop into action.

A left-hand stitch cam that is too steep on the side shown as *A* in the accompanying illustration, Fig. 7., will

FIG. 7

cause drop stiches in various parts of the stocking. When the slope of the cam is too steep on the side indicated, some needles will bound down further than others, causing drop stitches.

Cut-Outs in the Gore.

The general cause of cutting out on the gore of the heel and toe is a bad needle, a burr on the side of the needle, a bad hook, a bad latch, or a needle out of line when raised up. A broken sinker or a sinker with a burr on its side will also cause this.

In case the heel and toe is too tight, cutting out will result. The toe should measure, from end of gore to toe guard, 1¾-inches. If the wrong yarn is used, or the yarn runs heavy, the heel and toe will be too light. It is also found frequently that the thread being caught somewhere along the line is causing cut-outs.

One of the purposes of the sinker cams is to cast the stitch off of the hooks of the cylinder needles after the stitch has been formed. If the cams are not set in far enough, the strain on the stitches will be too great, causing cutting out. The same thing will result if the cams are set in too far.

The sinker cams should be set so that the back of the needle is even with the throat of the sinker as the needle rises. The throw of the sinker cap, which is secured by the set screws on the sinker cap, should be in as far as possible without having the sinkers project into the needles where the stitch is being formed. Extreme care must be taken in making the adjustment for the throw of the sinker cap. When making the adjustment on the throw of the left-side sinker cam, it must be taken into consideration that the slackening cam goes in ⅛-inch when on the splicing, which brings the sinkers in so much quicker, so if the cap is set in too far, the sinkers will project into the needles, where the stitch is being formed, causing cutting out.

An improperly concaved stitch will cause cutting out in the gore. Instructions for correcting this have been explained under "Concaving a Stitch Cam."

Splicing Trouble.

Due to the excessive pounding that the splicing rod gets, the wall next to this rod sometimes breaks. This results in the splicing finger not getting its full throw, resulting in the splicing being thrown out of line, or in various parts of the foot. This is one of the first things to look for. A new wall, of course, should be put in.

The medium needles are the most frequent cause of bad splicing because the splicing thread comes in and goes out in these needles. One of the most common troubles of bad splicing is on the side coming out, the splicing thread being thrown over one or more needles. The three medium needles on the side coming out should be bent out a hair further than the medium needles. Care must be taken not to bend these out too far or they will come in contact with the throat plate and break. It does not do any good to bend the needles on the side going in; all that can be done there is to have the needles in a straight line.

If the trouble cannot be stopped by straightening the needles, take the machine through by hand and watch how the thread comes out. The splicing thread should come out and go in on the first medium needle next to the long butt needle on both sides. The proper throw of the finger can be secured by either putting a piece of paper under the splicing cam, or grinding a little off the cam as the case may require. If the throw is not high enough, both in coming out and going in, the adjustment can be secured by changing the eccentric adjustment on the splicing rod.

When the machine is on splicing, if the welt presser is not in far enough, it will allow the thread to bound over the presser, then when it drops in again it does not catch on the needles, resulting in the splicing thread being out in various places in the foot. The remedy is to set the presser in a little further, taking care not to set it in too far, as this will cause trouble when on the welt.

If there is a burr on the edge of the jack dial, the splicing thread will get caught on its way out, throwing the splicing thread out the same way as is explained in the preceding paragraph. The burr, naturally, should be smoothed off.

Also, in order to get good results in splicing, the cylinder needles must be perfectly straight.

It is a general practice to put a yarn tension on the splicing thread to keep it from throwing the splicing off. A yarn tension, however, should not be put on the machine for the splicing unless everything else has been tried to stop the trouble. There are so many adjustments to make a good splicing that a good fixer will not do this except as a last resort. If a tension is put on, it should be just enough to keep the splicing thread from vibrating. If too much tension is applied, the plaiting will be off in the foot. This spoils the appearance of the stocking.

Loops Left Up at the Transfer.

The general cause of loops being left up at the transfer is a needle out of line, or a dial jack not being straight, or being broken, resulting in the needle not going through the dial jack when making the transfer.

Furthermore, one of the purposes of the welt presser is to hold the loops on the jacks when on the welt, and to push the work down in the cylinder; otherwise, the work would pile up when on the welt, owing to the loops being on the jacks. If the presser goes in too far when on the welt, it will throw some of the loops off the jacks. This will result also if the presser does not go in far enough. The hem will get puckered up if the presser is not in far enough.

The welt presser should be set so that the point of the presser extends under the dial ¼-inch, when on the first part of the welt. When the machine makes the change from cotton to mercerized, it should go in ⅛ inch further. The adjustment for the presser is secured by the adjustable plate on the take up thrust bar No. 8289, also by the set screw on the end of the presser. Extreme care should be

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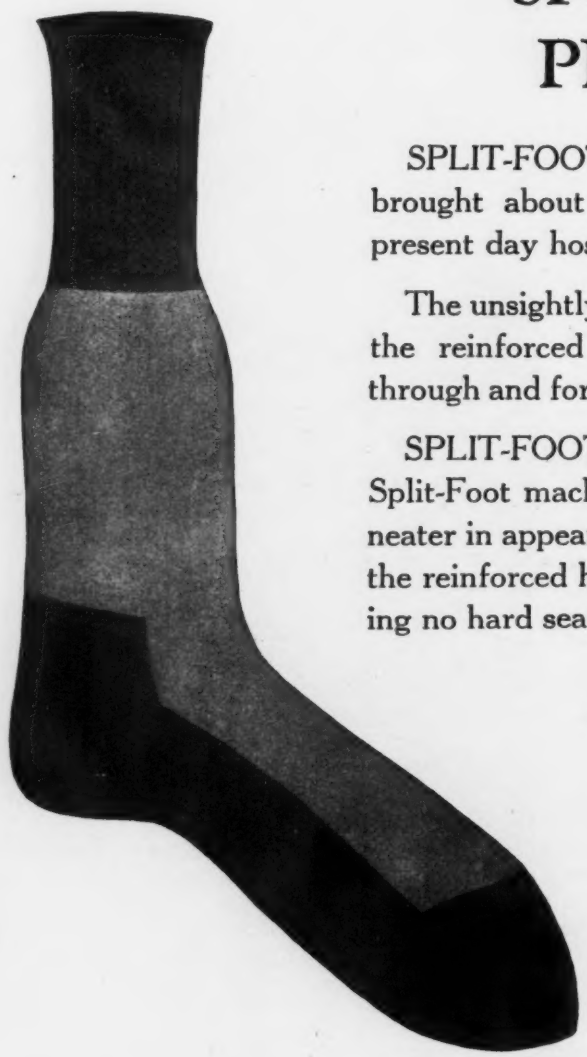

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taken when changing the adjustment so that it does not let the presser out too far when on splicing, causing the splicing thread to miss. Adjustment of the presser can sometimes be secured by bending the point of the presser up or down as the case may require.

If all the dial jacks do not go between every other needle when making the set-up and transfer, loops left up will result. This adjustment can generally be made by setting the dial ahead or back as the case may require. When a machine runs for a considerable length of time the jack dial gets off center, and when an attempt is made to set the dial ahead when on the set-up it will be off on the transfer, and vice versa. This will result in loops being left up at the transfer. Instructions for centering up a dial so it will come out even on the set-up and transfer were printed in the preceding article, under the heading,

Centering Up a Jack Dial.

which instructions are repeated here for convenience in connection with this subject:

"If the jack dial cannot be gotten in line with the cylinder needles, centering up of the jack dial is necessary. The following is the procedure: Take off dial, dial levers, dial plate, remove gear cover from dial gears, mark gears so that they can be meshed back again in exactly the same place, pull out dial shaft and remove the gear that the shaft goes through. Put the machine on the heel or toe, raising all of the short butt needles level with the long butts. Put in the centering dial for the purpose with the hub pointed down into the cylinder. Take out the two pins holding the cross bar No. 5557. Loosen up the screws holding the cross bar No. 5557. Put cover down and adjust the shaft hole in the cross bar No. 5557 so that it is in a perfect line with the hole in the centering dial. Then tighten the screws that hold the cross bar No. 5557, being careful not to get it out of line with the centering dial while doing this. Ream out the pin holes, putting in larger pins. Put back together."

A broken cylinder jack will leave the needle down when making the transfer, resulting in the needle not going through the dial jack, leaving the loop up.

If the loops are left up near the medium needles, it is generally caused by all the dial jacks not coming out when making the set-up, resulting in the yarn not getting on all the jacks. If the push-out cam drops out before the machine makes a full revolution, the remedy is to set the auxiliary racking pawl lever cam No. 6274 back about ⅛-inch or so as the case may require. This causes the drum pawl to bring the push-out dial cam a little later, bringing out all the jacks. Care must be taken not to change the adjustment very much as this will cause the machine to break needles when going through some of the changes. If set back too far the machine, as it transfers off the welt, will not bring the transfer push-out cam quick enough, leaving two or three short butt dial jacks out, which will cause trouble when on the splicing.

Sometimes it happens, when a dial smash occurs and many jacks are taken out, that some of the jacks are not put back according to the marks on the dial. This results in the jack not coming out and transferring at the proper place, causing broken jacks and needles which leave the loops up at the transfer. To prevent this, the dial should be checked over carefully according to the marks.

Cut-Outs on Yarn Changes.

A cut-out from cotton to mercerized inside of the welt from the top of the leg to the boot, is generally due to the yarn clamp not lying flat on the plate. The purpose of the yarn clamp is to hold the thread steady and keep it from bulging out, when making the yarn change. If there is not enough friction on the yarn clamp, the thread, as it is going through the yarn change, will bulge out and not go into the needles soon enough to prevent the cut-out. To remedy this, take the clamp out and give it a little more bend so it will lie flat on the surface. The yarn clamp gets bent out of shape by the constant threading of the machine as the thread is run under the clamp to be cut off. The yarn clamp is generally the cause of all cut-outs on yarn changes in various parts of the stocking, and it would be a good thing to check these over from time to time.

When changing a center cam, care must be taken to see that it does not draw the needles down too low, thus not leaving the tops of the needles high enough as they pass the throat plate to catch the yarn as it is going through the change. The same thing as just described will occur if this is the case. The remedy is to take a little off of the bottom of the center cam, so as to let the needles project a little higher as they pass the throat plate. Care must be taken not to take off too much, because the needles will get caught on the right point of the left hand stitch cam, and also it will throw the high splicing cam off as the machine goes into splicing. Some of the other machines should be examined to determine how high the needles are at this point.

Other things that will cause this same trouble are: a finger sticking as a result of a weak spring; a rod binding; or lint on the bottom of the throat plate, not allowing the finger to drop all the way down. Fingers should be oiled once a week at least.

If the trouble is in the heel and toe, the method would be to check up on the things already mentioned under this heading. There are two kinds of cut-outs that are caused in the foot of the stocking. One is where the yarn does not drop in quickly enough as it makes the change from the foot to the heel and toe, and the other is where the machine cuts out on the yarn change because it is knitting too tight. Cut-outs because of knitting too tight have already been discussed.

Welt Puckered Up.

This trouble is due to the welt presser not setting properly when on the welt, which causes the hem not to work down properly. When this difficulty occurs, proceed as recommended under the heading "Loops Left Up at the Transfer," in this article in connection with the welt presser. If the dial is down too low, there is not enough room for the presser to work the fabric down, and the dial should be raised a little.

A burr, on the end of the dial jack, or a broken jack, will pucker the fabric up, for as the machine transfers off the hem the fabric catches on the end of the jack, thus preventing the fabric from working down.

Breaking Needles in Heel and Toe.

Breakage of needles on the heel and toe is generally caused by the up-picks not picking the needles high enough to clear the points of the back center cam. The up-pick cams control the throw of the pickers. On the underside of the up-pick cams is an adjusting screw which can be set to get the proper throw. Mention must be made here

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of the importance of seeing that the picker does not get out of adjustment with the stitch cam when changing the throw of the picker.

If the up-picks do not fit into the stitch cam, the result is that the needle does not get on the picker on its upward throw and is drawn only half-way up. The needle then hits the point of the center cam, breaking off. The pickers should be set so that when the needle rides over this part of the cams it will engage in the picker. If the picker projects above this point the needle will not get on the picker.

The up-pick spring cam causes this trouble, also. If it breaks, the result is the picker does not fit into the stitch cam, which will draw the needles up only half-way, breaking them on the center cam. If the spring is too weak it will not bring the picker to its proper position on the stitch cam, with the same result. The springs should be snappy. However, if the spring is too stiff it will put too much strain on the needle on its upward throw, causing it to break off.

If the cylinder spring is too weak it will not hold the needles in the cylinder tight enough, resulting in their picking too easily. Also, if there is not enough friction on the cylinder needles it will cause them to break.

If the right guard cam is not set down far enough, two needles are apt to get caught on the right picker, resulting in only one being drawn up while the other is only half drawn, jamming into the right point center cam. The remedy is to put a piece of paper under the guard cam or take it out and give it a twist so that it draws the needles down far enough to engage only one needle at a time when the picker is working. Care should be taken not to get the cam tipped too far for the needles might get caught on its point and break off.

In case the down pick does not pick the needles down far enough on its left hand side, the needles will get caught on the point of the center cam, breaking off. This is due to the down pick being ground too short. A larger down pick should be put on, but should not bind on the cylinder. Just enough should be taken off of the point on the center cam to allow the needles to pass under. If too much is taken off, it is apt to throw the adjustment of the up-pick off by not picking the needles high enough.

The needles catching between the cylinder and the switch cam, when the needles are being picked down on that side, will cause them to break. A little should be taken off the switch cam at the point where they bind, and the switch cam tipped back just a hair to allow the needles to pass freely without binding.

When a new picker is put on a machine it should be smoothed up with fine crocus cloth or a fine stone to take off the burrs, especially in the corners. This is of importance because as the needles are being picked up or down, if they are not smooth, they will hang to the pickers, resulting in their being pulled out of the slots in the cylinder, breaking off.

This concludes the series of four articles relative to the Model K Scott & Williams knitting machine.

RYMI.

The dates of the Knitting Arts Exhibition and Annual Convention of the National Association of Hosiery & Underwear Manufacturers at Philadelphia are March 22-26.

Seamless Ribbed Tops on Full-Fashioned.

Recently an inquiry came to COTTON asking for information regarding the use of seamless ribbed tops on ladies' full-fashioned hosiery. Investigation shows that this practice has been carried on for some time, and that patents covering either the knitting of the tops or the looping of them on the leg are owned by the H. C. Aberle Co., Clearfield and A Streets, Philadelphia, it being an invention of a Mr. Hatfield.

The reason for the use of the seamless tops on full-fashioned work is, of course, the reduced cost of the finished stocking. The seamless top is produced more rapidly than the full-fashioned top could be knitted on, and the cost of knitting is much less per unit as the seamless knitters draw lower wages in comparison with those paid full-fashioned knitters. The cost of the extra looping is said to be insignificant, in contrast with the saving that is effected.

It is understood that several manufacturers are using this method, under royalty or other agreement with the H. C. Aberle Company.

In connection with this inquiry, one correspondent says that so far as using seamless ribbed tops on ladies' full-fashioned hosiery is concerned, he does not believe this has been done except on an experimental scale, although it would be thoroughly possible to produce merchandise of this character. But in reference to using ladies' seamless tops on full-fashioned stockings, he tells of one full-fashioned hosiery mill in Philadelphia which has turned out a large amount of goods of this character. The procedure, it is stated, is to have special Scott & Williams K machines built with 400 needles on 3¾-inch cylinders. A hemmed knit top, that is, a top with hem knit in, is produced on this machine for the length of cotton top desired on the full-fashioned stocking. The top is then split open, laid out flat, and topped on a topping bar or point bar and transferred to the full-fashioned machine and the silk thread introduced. The fashioned pattern is seamed up the back the same as in regular full-fashioned work. In carrying out this operation, it is necessary to have the full-fashioned legger especially equipped so that topping bars may be used the same as on a footer.

It is stated also that a North Carolina full-fashioned mill is turning out a similarly produced stocking wherein the entire leg of the stocking is made on a Scott & Williams seamless machine and then transferred to a full-fashioned footer, which gives the stocking the characteristics of full-fashioned stocking in foot only.

A Hint on Finger Selection.

EDITOR COTTON:

This following pointer in connection with plaiting may interest the readers of "Knitting Kinks":

On the Scott & Williams knitting machine there are five fingers through which the yarn enters into the machine. I have seen some mills, doing plaiting, attempt to plait the yarn from, say, the second needle from the left-hand side, on top of the next or third finger yarn. This they probably can do by running excessive tension on the yarn, or in some cases, by not running any and making it "roll" in.

However, the best plan I have found is to use the "face"

yarn in the furtherest finger to the right, and come toward the left with the backing yarn. You will notice that the double sole finger is the extreme left-hand finger, and it is the longest finger, so this would prove the practical theory of the idea.

This should apply, of course, regardless of what kinds of yarn are being used. A. C. (N. C.)

A Boarding Room Form.

EDITOR COTTON:

Know at a glance what is to be boarded.

This form is to be filled in when leaving mending or stock room. It requires but a little time and saves a lot of trouble. The finisher can refer to the form and tell if the goods he is wanting are in the boarding room. Of course the man who hauls the lots from the boarding room to the finishing room will have to check off the goods that he brings up, and by doing this, all concerned can keep up with all styles and dozens without having to take stock in the boarding room possibly several times a day. I fully believe that this will prove profitable to any mill, especially since so many styles are having to be made.

W. H. H. (GA.)

GOODS SENT TO BOARDING ROOM DATE

STYLE	5	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	LOT NUMBER

Paints Gears to Avoid Wrong Setting.

EDITOR COTTON:

One frequent difficulty with some models of the Scott & Williams machines, where a needle or transfer bit dial is used, is the setting of this part with the cylinder before the machine is started.

The dial shaft is geared with the cylinder shaft. These two gears that mesh must be timed properly, before starting, which is done by meshing two screws, in both gears, with the handle of the machine toward the operator. If these gears should be set off one tooth either way, when starting the machine considerable damage to the needles in the cylinder and dial results. This is a common occurrence every day in any mill having Scott & Williams machines where a needle dial is used.

Operators of these machines, although they may be trained thoroughly in setting these dials, set many wrong. Some of the causes are: too big a hurry, setting the needle dial wrong, and poor lighting conditions.

The last—poor lighting conditions—is, in my opinion, the most frequent cause. The dial gear cover makes it difficult to see the screws on the gears.

To overcome this condition, I have painted the surface of the two gears with white enamel paint. The two screws I painted black. This makes a good contrast of colors, making it easier to see, with less chance of setting these two gears incorrectly. This completely put an end to the trouble from this source.

CONTRIBUTOR No. 4332.

Overcoming Tension Trouble.

EDITOR COTTON:

Sometime ago in "Knitting Kinks" you published a question from Contributor No. 192 relative to reverse plaiting. The writer very recently was up against the same thing, and the only way I overcame my troubles was to put two Pigeon compensating yarn tensions, style B, on our machines. By putting two tensions on a machine I had perfect control of both leads of silk. One tension had a very heavy drag and the other a very light drag on the silk. After putting the tensions on the machine it showed up the imperfections, such as bad sinkers and needles. After these imperfections were taken care of the fabric came from the machine plaited perfectly.

I secured these tensions on trial and only accepted them after they were found to give satisfaction.

M. H. (PA.)

Waste Prevention and Waste Recovery.

EDITOR COTTON:

The question of waste prevention and waste recovery is something that is always with us. Every mill man has the problem before him sometime in his career and frequently a good many times. This matter is brought directly to my attention by the question of Contributor No. 1532 which appeared recently in "Knitting Kinks," and believing that it will be of general interest, I am taking this opportunity to give some idea of our methods of handling waste.

With a grand total of mixed waste of 100 pounds to 250 pounds a week, and with the material in this mixed waste costing us as high as $10.00 a pound, our reasons for trying to determine causes and remedies are very evident.

Each skein winder, cone winder, knitter, topper, joiner, seamer and leg inspector is supplied with a waste bag. Each week these bags are collected and the waste weighed and prepared for sale. From the amounts collected the waste report, a copy of which is shown in the accompanying form, is compiled. By means of this report the management keeps a close check on each department and even on each operator in the winding and knitting departments. Ratios of pounds of waste per 1,000 pairs of legs and per

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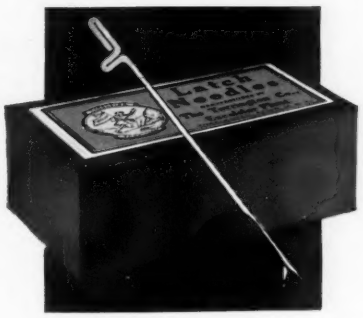

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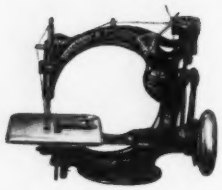

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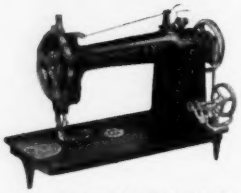

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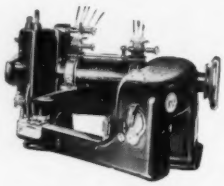
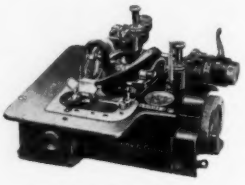


FLATLOCK MACHINE



OVERLOCK MACHINE

WILLCOX & GIBBS SEWING MACHINE CO.

Home Office: 658 Broadway, New York, N. Y.

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Canadian Representative: W. J. Westaway Co., Ltd., Main and McNab Streets, Hamilton; 275 Craig Street, W., Montreal P. Q.

WILLCOX & GIBBS SEWING MACHINE CO., Ltd.,
20 Fore Street, London, E. C. 2.

Branches

Nottingham, Birmingham, Manchester, Leeds, Leicester, Luton, Glasgow, Belfast
Paris, Brussels, Milan

WEEKLY WASTE REPORT

Mill _____ Week Ending _____

LEGGING

Mach No.	Weight	Mach. No.	Weight	Mach. No.	Weight	Mach. No.	Weight

How White is the "Pale Moon"?

Not nearly as White as Solozone-Bleached Goods

(A permanent white without weakening, soft, odorless and elastic)

We are equipped to process sample lots of any size under mill conditions and instruct the bleacher

R&H CHEMICALS

The ROESSLER & HASSLACHER CHEMICAL CO.
709 Sixth Avenue
New York

659 D

1,000 pairs of feet and per 1,000 pairs topped are figured on each report. These ratios serve as measuring sticks to apply to each week's waste.

After weighing, the waste is separated into different classes: all silk, mixed, rib top, curly white and fabric. All these classes are later baled separately and sold. The reason for separating is the re-sale value. For example, "all silk" is worth eight to ten times as much as mixed waste.

Our records show that re-sale of waste alone saves a considerable sum and with our close check on all waste, we feel that a handsome dividend is paid by our waste department.

H. N. (MASS.)

Cut Stitches at Transfer on H-H.

EDITOR COTTON:

I wish some readers of "Knitting Kinks" would tell me what will cause an H-H machine to cut the stitches when transferring off of the top. The trouble I mean does not occur just anywhere in the top, but right where the stitch transfers from the dial needles to the cylinder needles. It is not a drop stitch, but a cut stitch. We are working on the adjustment of the transfer cams, but do not know whether we are on the right line. Any information regarding a method for remedying this will be appreciated. We use an 18s double carded cotton yarn for the top, and then a 45s mercerized yarn. When we used a mercerized yarn in the top also, we did not have this trouble. Our machines are 220-needle, with 48-gauge needles.

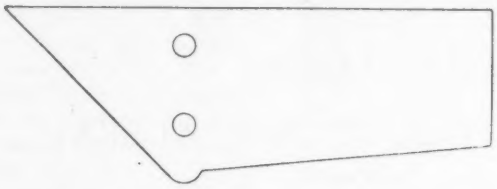
CONTRIBUTOR NO. 2426.

Getting a Long Loose Course on Ribbers.

EDITOR COTTON:

In the June number of "Knitting Kinks" was a question with reference to cuts and drop stitches on the loose course on Wildman and Brinton ribbers.

Drop stitches on these ribbers is caused by the loop jumping over the needles as the cylinder needle rises, coming up to its full height, and the trouble might be over-



come by using a long hook needle, which is on the market, so that the stitch could not jump over the hook. Also, it is a good idea to run the dial down as close as possible.

Another suggestion would be to regulate the pattern wheel and disk to draw down half way and make a half of a loose course all the way around and then make the regular loose course. This half loose course will help take the strain off of the regular loose course and it can draw a little from it.

Still another idea in this connection is to use a long cam such as is shown in the illustration. I found a mill doing this some time ago. The idea is that it helps hold the long cylinder needle down until it gets to the point where the dial needles are drawn in, and that keeps the stitch from jumping over the hooks of the cylinder needles.

S. F. (N. C.)

Drop Stitches in Gore from Long Needles.

EDITOR COTTON:

Recently a reader asked about Scott & Williams K machines, on ladies' mercerized work, with back-seaming attachment, making drop stitches on the long needles just as the machine comes out of the heel and toe. This was answered later by "Rymi," but perhaps some suggestions I might give in this connection will be in order.

If the holes are occurring in both gores, it is my opinion that the trouble is caused by the gap closing ring. In some way it may open up too quickly and allow the needle latches to close before the needles raised to a high plane pass the throat plate. Or it may be that the gap ring is loose in the latch ring, which will allow the latches to get between the gap ring and the latch ring and close up.

However, if these holes come in one gore only, the left-hand gore, I believe he will find that the opening for the seaming finger is too close to the dropper post, and, as the dropper draws the needles down, the latches close.

If "J. F. D.," who asked this question, finds these suggestions help him, I would be pleased to have him advise us through "Knitting Kinks." W. B. (TENN.)

MS 4314

Centering Up the Dial on a Model K.

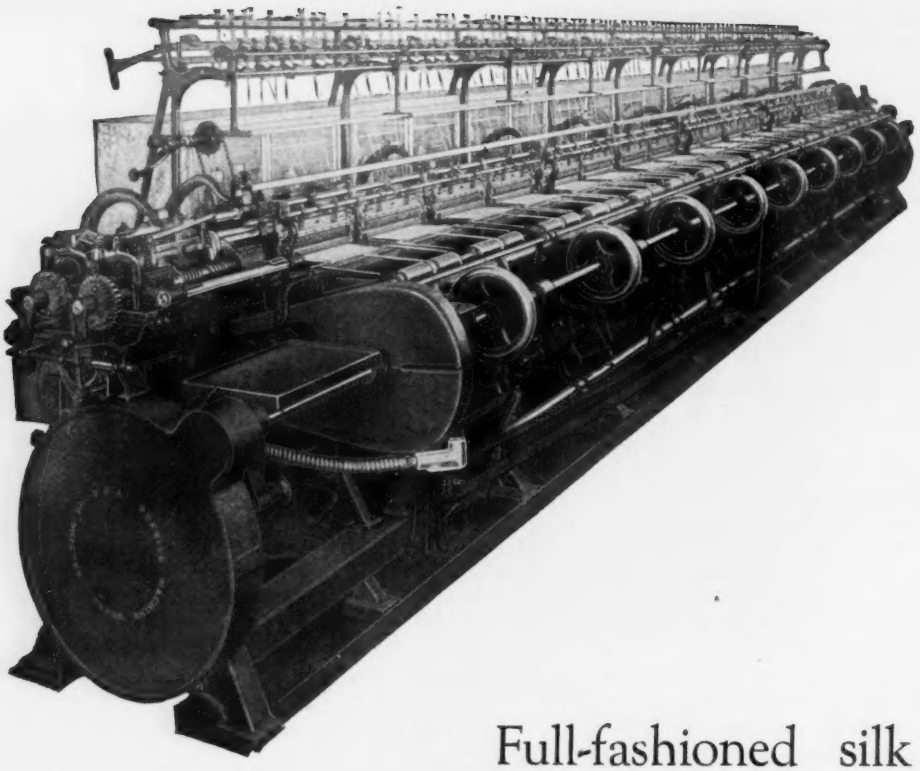
EDITOR COTTON:

I am reading with interest the series of letters in "Knitting Kinks" on using and adjusting a Model K machine. So far the methods suggested by the writer, "Rymi," for this work are similar to the ones used at our mill, with one exception, which I noticed in the October issue. I will tell you my way of doing this, as a matter of interest; not that I think his method is incorrect, but because I have found that our system works out better for us.

In discussing the way to center up a dial, on page 1311 of the October issue, after explaining to take off the dial, remove the gear cover, etc., "Rymi" recommends to *"Put the machine on the heel or toe, raising all of the short butt needles level with the long butts."*

Now, the way I do is this: I take the sinker cap off and push the sinkers back so that the centering dial will go down level on the brass, and I center it on the regular leg run, instead of the heel or toe, as he suggests. This allows me to raise and lower the head without danger of breaking the needles, which I believe is likely by using his plan; if the needles are raised the head cannot be raised and lowered without danger of broken needles. There are several reasons why I think the head should be raised and lowered when centering the dial, among them being that the brass might be uneven, causing the pin to bind, which would not be noticeable if this were not done, and also in order to make the transfer jacks go in and come out correctly.

I am not criticizing "Rymi's" suggestion, but merely telling you what I do. I would be glad to see a comment from him, and other readers, upon my idea, in case they do not agree with me. As a whole I believe these articles are doing a constructive good and are appreciated by the knitting mills. K. M. S. (GA.)



Full-fashioned silk hosiery manufacturers who have standardized on "Reading" machines are the most successful because their machines are producers of *quality* hosiery on a *quantity* basis.

TEXTILE MACHINE WORKS
READING, PA.

The "READING"
FULL-FASHIONED HOSIERY MACHINE

Keeping Hosiery Sizes More Uniform.

EDITOR COTTON:

If an operator has a convenient means of measuring the stockings as they come from the machines, it helps greatly in keeping the sizes more uniform. A simple but effective method of doing this is first to get a stocking which is considered to be the proper length. Hang the toe of the stocking on the latch ring retaining spring—this is the spring which holds the latch ring down to the cylinder. Note where the top of the stocking comes on the left leg of the machine, and put a white line at this point on the leg or frame as the case may be.

As the work comes from the machine, if the operator is in doubt as to whether the stocking is of the proper length, she can hang the toe of the stocking on the retaining spring and note its length.

Although this does not give an accurate check on the sizes, I find it helps greatly in keeping the work more uniform.

I have found this suggestion to be especially useful on Model R I Scott & Williams machines.

CONTRIBUTOR No. 4342.

Knit Underwear Men Meet at Utica.

A beneficial meeting was held at the Hotel Utica, Utica, N. Y., on December 8th and 9th by the Associated Knit Underwear Manufacturers of America. This constituted the usual semi-annual meeting, and was the last under this order, since in the future the annual meeting will be held in the fall, and the semi-annual meeting in the spring, which reverses the order of meetings.

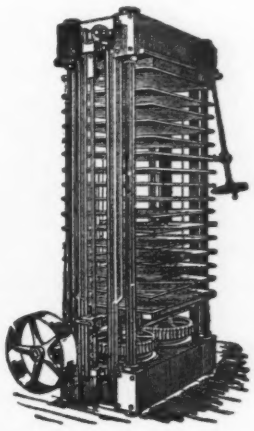
In view of this change, officers to serve for the coming association year were elected. R. S. Cooper was re-elected president; Frank B. Harder was re-elected first vice-presidnt, and Oscar Gridley was chosen to remain as treasurer. E. A. Clements was named second vice-president succeeding R. A. Kimball, who has retired because of ill health.

The meeting consisted of a banquet on Tuesday evening, December 8th, and two sessions on Wednesday, December 9th. President Cooper presided at the Wednesday sessions. The morning meeting, after a preliminary address by the president, heard the report of Secretary Roy A. Cheney, which was a resume of the various activities of the association during the year. Following the election of officers, L. U. Lynt reported as chairman of the advertising committee and outlined the work that has been done and that which is proposed.

Edward T. Pickard, chief of the Textile Division of the Bureau of Foreign and Domestic Commerce, Department of Commerce, was the speaker at the luncheon which followed the morning session. The matter of export markets for underwear was the subject of his remarks.

Associational activities formed the basis of the afternoon program on Wednesday. Byron G. Moon, director of the association's advertising campaign, outlined the details of the project to the members, and told of what is being done and the results.

Mr. Clements made the report of the standardization committee, telling of the progress made thus far, especially with reference to the enforcement of standards as adopted.



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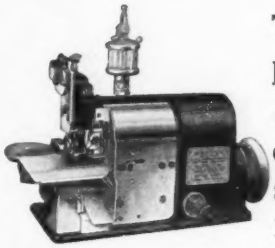
Hot Plate Screw Press
FOR
Hosiery and Underwear
Write for Catalog and Prices
Reliance Machine Works
FRANKFORD, PHILA.

MERROWING



THE MERROW HIGH SPEED OVERSEAMING, OVEREDGING AND SHELL STITCH MACHINES

FOR FINISHING ALL KINDS OF KNITTED AND WOVEN FABRICS.

MERROW
Reg. Trade Mark
FOR QUALITY AND QUANTITY PRODUCTION AT LOW OPERATING COST
— MERROWISE —
THE MERROW MACHINE CO.
ESTABLISHED 1838
16 LAUREL ST. HARTFORD, CONN., U. S. A.

The 4F WINDER

A dependable, economical producer for the Cotton Manufacturer, equipped to wind hard or soft Silk, Rayon and fine Cotton yarns. Mechanically perfect, featuring motor attachments, spiral gear driven take-up shafts, patented geared swifts, adjustable cams and many other improvements.

The 5B Spinner

A combined Doubling and Twisting Frame for Tram Spinning,—hosiery threads in Silk, Silk and Cotton mixtures and Rayon—capable of handling materials from 2 to 14 threads.

For the last Sixty years we have been makers of the best machinery for the silk trade, including Winders, Spinners, Twisters, Reels, Doublers, Redraws, Warpers and other special textile machinery.

THE ATWOOD MACHINE COMPANY

Silk Throwing Machinery

Stonington, Conn. **95 Madison Avenue, New York City**

Southern Representative: H. L. McCALL, Cutler Bldg., Charlotte, N. C.

STANDARD MERCERIZED YARN

SPINNERS MERCERIZERS CASSERS BLEACHERS S&T

The combination of uniformity—Lustre and Strength, plus Economy in knitting represent the essential qualities of good mercerized yarns.

STANDARD YARNS are recognized by these qualities.

STANDARD-COOSA-THATCHER CO.

CHATTANOOGA, TENN.

Sales Office: Lafayette Bldg., Philadelphia

Canadian Representative: Wm. B. Stewart & Sons, Toronto, Montreal.

Messrs. Clements and Beecher Crouse were appointed as a committee in this connection, and A. W. Clarke and Secretary Cheney were named as a committee to decide with reference to label sizes, etc.

H. D. Keeler, of the Paperboard Industries Association, who at a previous meeting discussed the matter of using fiber boxes for shipping underwear, again spoke to the association, reporting progress made since his last appearance.

The association headquarters has been working with the Southern Yarn Spinners' Association, Charlotte, N. C., in regard to yarn numbers used by the knit underwear industry, and a continuance of the cooperative work in the matter of standardization of yarn numbers and the elimination of extra sizes was voted.

Resolutions adopted included an endorsement of the cotton reports of the Department of Agriculture; and opposition to the proposed tariff on underwear imported into Great Britain, and support of efforts to reduce the tariff on American knitted goods going into Australia.

The place and time of the semi-annual meeting in the spring will be decided upon by the executive committee and officers.

At the banquet on Tuesday evening, Professor Gus W. Dyer was the after-dinner speaker.

The Full Fashioned Situation.

Whether the manufacture of full fashioned silk hosiery is or is not being too rapidly expanded is a moot question in the industry and among large distributors. Some interests hold that, considering the broader use of women's full fashioned and the rate of increase, this year's expansion pace might be continued for 20 years before encountering danger of over-production. Few seasoned manufacturers are counting the chickens that far ahead, but that 1926 will witness the addition of possibly as much new equipment as was installed in 1925 seems likely, considering the contracts that have been placed with machine builders. While a number of small new mills have sprung up quite recently and more will be in existence soon, there is reported decline in demand for equipment for large concerns. Considerable machinery is known to have been contracted for for deliveries as late as December, 1926, much of which will not be in operation until 1927.

Expansion of the full fashioned field is on a more gigantic scale even than is indicated in the reports of installation of equipment. No longer can it be measured by the number of machines. While in the past a machine of 18 sections represented maximum output per unit, some recent and coming installations are of 20 to 24 section machines, the latter coming, mainly, from Germany. It is stated that a large part of the machines of domestic build to be added to next year's new equipment will comprise 20 sections each, and that numbers of the foreign machines already in use here knit 72 courses per minute, comparing with an average maximum of 50. In at least one mill where 24 section, 72 course, machines have been in use for several months they are said to be unsatisfactory, in that in the speeding up more time is lost than can be gained, by reason of the machines being overtaxed and necessitating more frequent stoppages.

In estimating the increase in output of hosiery based on machine installation there must be taken into the reckoning the fact that not only have many of the newer machines a greater potential production, but that with small plants manufacturers are making one legger serve the purpose of three. As every manufacturer knows, a plant unit may be one footer and three leggers or one footer and four leggers, depending on the number of sections comprising the latter. Numbers of small mills owned and operated by knitters, union and non-union, who pay no attention to union work-time limitations, operate leggers three shifts and footers one shift, thus getting off the output of three leggers on single shift schedule. Or a mill with two leggers will operate them two shifts and keep one footer going steadily one shift. Taking the three legger and one footer unit for illustration, it is readily apparent that in mills having, say, a half dozen units, there can be a very great increase in production, with no increase in investment in equipment. But this method of operating cannot, of course, be practiced in mills in which the union dominates.

In Philadelphia the union, it is stated by manufacturers, permits 40 hours overtime operation within a year, without going through the formality of granting special dispensation. Some of the Philadelphia mills last month, when orders at old prices were piling up, started on a schedule of one hour a day overtime for forty days. In Reading, where the union is conducting a campaign for strengthening its organization, a number of employees in a mill who were agitating for a closed shop, lost their jobs. It is doubted by manufacturers that the union will become entrenched there.

Rayon Underwear Becoming Popular.

Rayon underwear for women is reported by our Philadelphia correspondent as having taken a fresh and, apparently, lasting grip on popular approval. This correspondent writes:

The better grades of rayon underwear were in exceptional demand during the pre-holiday shopping period. Department stores and women's specialty shops had stocked conservatively, and had difficulty in maintaining size and color assortments, as was disclosed in their day-to-day orders placed with jobbers, who themselves were calling on manufacturers for spot shipments. Rayon underwear was in demand for gift purposes, and, it was believed, made greater strides in the direction of permanency than at any time heretofore. An attractive imported line which was in especially strong call came from a manufacturer in Holland.

With a view to getting to the bottom as to the wearing quality of rayon underwear, a sample from a high grade line was submitted to the research bureau of the Federal Department of Commerce, it is stated by a Philadelphia jobber handling the line, for a technical test. Subsequently, it is said by the jobber in question, the Department of Commerce intimated it would cause to be broadcasted instructions for laundering the fabric with maximum safety, the intention being to have the information reach laundries as well as householders. Carelessness in laundering and ignorance of the proper method, it is claimed, have operated to retard acceptance of rayon garments in competition with those made from Japan silk.

A Philadelphia establishment is putting into distribution a line of men's rayon union suits, which are designed to be sold in retail stores at $3 per garment.

The Yarn Market

Philadelphia, Pa., Dec. 16th, 1925.

Last week and up until the present writing carded weaving yarn rates lost ground, which brought them down to very nearly the low levels of the year. Knitting yarns appear firm, however, remaining up around the prices quoted last month, while combed peeler goods are also on a comparatively better price basis.

December, in closing out the calendar year in this market, has thus far presented no features spectacularly different from the previous prevailing conditions. Up until the last day of November prices remained reasonably firm, and on that date the first decisive change in two weeks occurred, this affecting plied carded skeins for weaving to the greater extent without much influence on knitting counts, which have fared well indeed for the past month, both so far as inquiry is concerned and as regards prices.

About three weeks ago there was some fluctuation noticed, but this was in no way general. In fact since the last report in these columns, such changes as have occurred have been due largely to the local situation of stocks of certain grades and have resulted, also, directly from important changes in raw cotton quotations. Beyond the more recent recession as stated there have been very few fundamental changes whose effect has been upon the market generally. As a matter of fact, comment is heard in the market upon the remarkable firmness of the cotton yarn situation in the face of bearish influences, the continually increasing crop estimates of the Government being an example.

Last week saw the last of the frequent reports, and the market survived it with comparatively little negative effect. It is believed that with the reports a matter of more or less history, the influence of the raw material field has been largely eliminated so far as the yarn market is concerned, and that there will not be much heard from this sector until the new crop begins to figure in the mental speculation flights of those interested. The relative stability maintained by cotton itself through the various factors possible of destroying its composure is also being discussed.

So far as business transacted is concerned, there is nothing to report for the past month further than to say that the consuming end has continued the piece-meal method of buying; the habit being augmented by a seasonal inactivity in advance of the holidays and inventory time. In view of apparent adoption of this practice, it might seem that instability and irregularity would be prominent in the market, together with sagging prices. However, factors explain, against the apathy of the buying end so far as future commitments are concerned has been the absence of very much surplus in the market, as well as the attitude of the spinners in holding up their rates.

The drouth affecting part of the spinning section, as has been mentioned before, probably was responsible for some of the missing stocks; certain it is that this, together with the determined stand of the yarn manufacturers, have contributed largely to the firmer situation now existing than would otherwise have been the case, according to factors in the market.

With a large crop of cotton assured, yarn consumers generally are not worried as to the sources of supply for next year. It is certain, however, that their holding cannot be large. That they should drop out of the game toward the close of the year was to be expected.

For the new year, 1926, opinion differs as to the prospects. Several weeks ago, the bulls were almost unanimous, but now a vote probably would show an increase on the bear side. That hand-to-mouth buying will continue to be the rule is practically a foregone conclusion. Price at a profit should be available to those using discretion and judgment.

Philadelphia quotations on December 16th follow:

Single Skeins.

4s to 8s	35	10s	35½
12s	36	14s	36½
16s	37	20s	37½
24s	40	26s	41
30s	43		

Single Warps.

8s	35	10s	35½
12s	36	14s	36½
16s	37	20s	38
26s	42	30s	44
40s	54		

Carpet and Upholstery Yarn in Skeins.

8s 3-4 hard white warp twist	33½@34
8s and 9s 3-4 tinged tube	31
8s 3-4 hard twist waste	29½

Two-Ply Skeins.

8s	34½	10s	35
12s	35½	14s	36
16s	36½	20s	37½
24s	40½	26s	41½
30s	43½	40s	52

Two-Ply Warps.

8s	35½	10s	36
12s	36½	14s	37
16s	37½	20s	38
24s	41	26s	42
30s	44	40s	54

Frame Spun Carded Yarn on Cones.

8s	34	10s	34
12s	34½	14s	35
16s	35	18s	36
20s	37	22s	38
24s	39	26s	40
30s	41	40s	52½

30s double carded	42
30s tying-in	39½

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	56	20s	57
24s	60	30s	62
40s	70 @72	50s	80 @82½
60s	90 @92	70s	$1.00@$1.05
80s	$1.17½@$1.20		

Single Combed Peeler Yarn on Cones.

18s	50 @51	24s	54 @55
30s	60 @61	36s	64 @65
38s	67½@68	40s	69 @70

Mule Spun Carded Yarn on Cones.

10s	40	12s	41
14s	42	16s	43
18s	44	20s	46
24s	47	26s	48
30s	49	40s	57

Mule Spun Combed Peeler Yarn on Cones.

10s	50	12s	51
14s	52	16s	53
18s	54	20s	55
22s	56	26s	60
28s	61	30s	62
36s	64	38s	67
40s	70		

General Electric steam turbines rated at 500, 600 and 750 kw. are described in Bulletin GEA-235, just issued by the General Electric Company, Schenectady, N. Y. The general principles and advantages of steam turbines are discussed, and sections and steam path diagrams are shown.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, announces its Calendar for 1926. This calendar, 19 x 24, with twelve colored illustrations of processes in the manufacture of iron and steel, will be sent to any address on receipt of 10 cents to cover cost of wrapping and mailing, so long as the edition is not exhausted. Requests should be addressed to the Publicity Department of the company.

Our Atlanta Office

FEELING that the interests of our clients can be better served by our having two centrally located offices in the South, we have opened an office in Atlanta, while still maintaining our office in Charlotte, N. C.

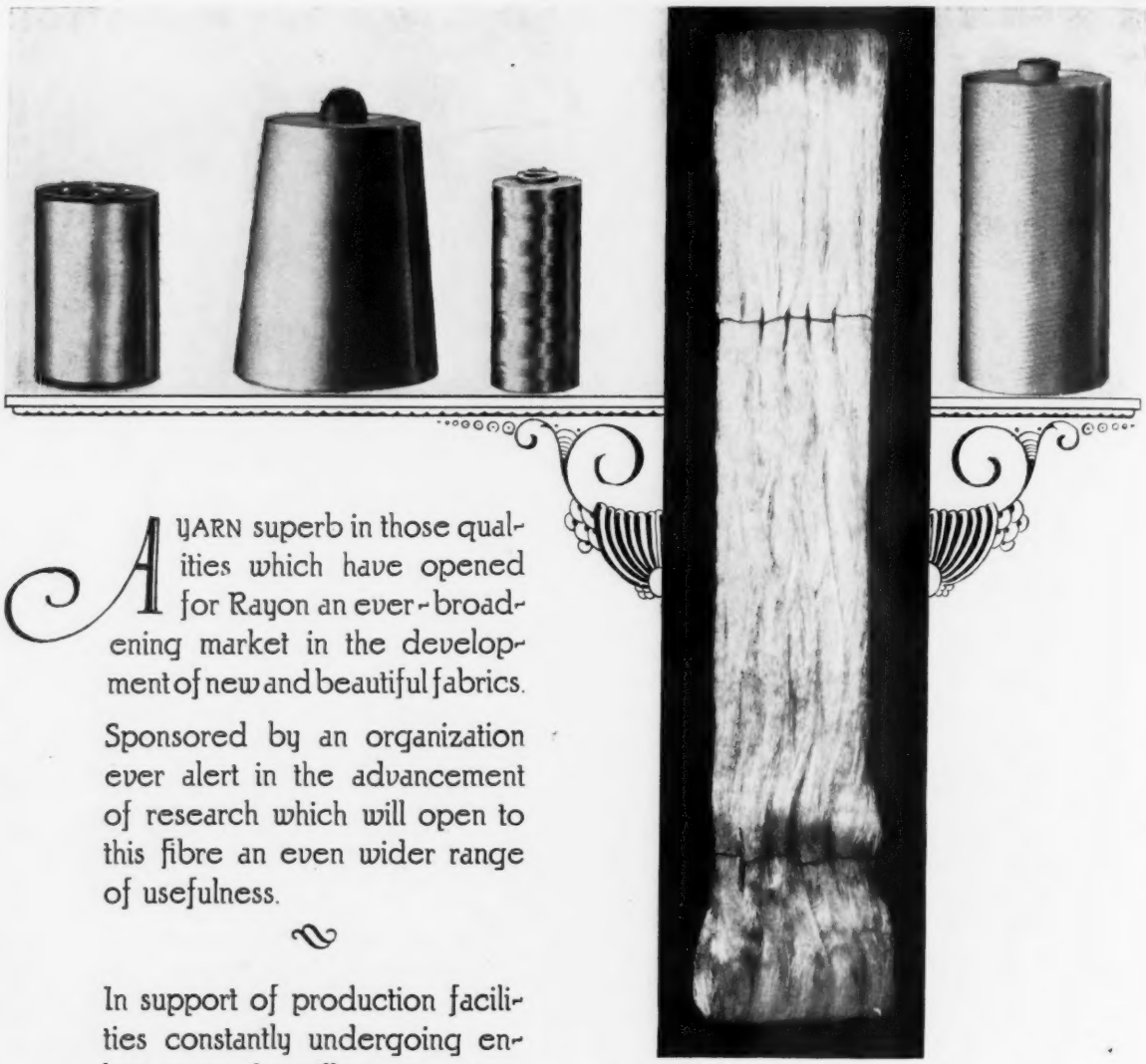
Our Atlanta Office is opened for the express purpose of taking care of the requirements of our good customers in the States of Tennessee, Georgia, Florida, Alabama, Mississippi, Louisiana and Texas.

Mr. Stribling, having had a varied experience in Southern mills, is qualified to handle all winding proposals.

UNIVERSAL WINDING COMPANY

BOSTON

UNIVERSAL WINDING



A YARN superb in those qualities which have opened for Rayon an ever-broadening market in the development of new and beautiful fabrics.

Sponsored by an organization ever alert in the advancement of research which will open to this fibre an even wider range of usefulness.

In support of production facilities constantly undergoing enlargement, the mill operator now receives deliveries of our Yarn direct from our own throwing plant, dyed to specification and put up in those forms suited to his individual and immediate requirements.

"Industrial" Rayon

The INDUSTRIAL FIBRE COMPANY Inc.

148 MADISON AVENUE

NEW YORK CITY

The Knit Goods Market

A general cleaning up of stocks prior to the periodical tell-tale inventories punctuating a period of wide-spread prosperity, a refinement in the construction of the products of the knitting machine, fundamentally sound conditions, and the fact that distributors have yet to do a great deal of contracting for needs for the early months of 1926, supply a strong background for a picture of a spirited market for knitted goods.

While cautious manufacturers will be inclined to adapt their production to consumptive demand so far as it can be gauged, there is an intrepid element that may cast conservatism to the winds and speculate on the moderate prosperity of last Fall and preceding months, with the posibility of again oversupplying the market.

Heavy employment, bounteous crops and an ingrowing confidence justify the consumer buying reflected in quite recent months, and there appears nothing to check it during, at least, the first half of the year, and what happens then may depend on the size and value of the oncoming crops.

Hosiery manufacturers who have sold ahead for a few months are practically assured the orders will stick, or at any rate, will not be affected by fluctuations in the raw material markets. There is a possibility of a downward revision of the prices of artificial silk during the first quarter, but by the time it will have gone into effect, if at all, it will have been pretty well discounted, as rumor has been busy for some weeks with unfounded intimations of reductions.

Japan silk seems likely to remain at about the level maintained for several months, and its position is believed to be strengthened by the fact hosiery manufacturers as a class own comparatively little silk and have large silk hosiery contracts which must be filled.

As the Department of Agriculture last month issued its final estimate of the cotton crop, there will be no disturbance by reason of reports of more or less bales. Manufacturers who are contracting for yarns are acquiring them at advantageous prices and are able to go to their trade with lower prices, something that ordinarily stimulates buying at a time when complaint that values are too high is common.

The manufacturers of winter underwear have had a fairly satisfactory start for the next season, and retailers are beginning to buy for their summer requirements, so that more activity should be witnessed in the knitted light weight industry.

Sweater coats opened groggy, and conditions in this division of knit goods are not as rosy as they might be. Manufacturers came on the market for 1926-7 about six weeks too early.

Distributors are not going to depart from their policy of restricted buying. Initial orders will be large or small depending on conditions experienced by distributors last year. If larger, it will be because the merchant's needs are greater, and not because in his elation over a fat year he forgot several lean ones or modified his policy for the good of the trade. It is the opinion of most of the wiser heads encountered in the textile markets that the so-called hand-to-mouth buying will be practiced for years to come, at any rate to the end of this year.

This being the policy that blocks mass production, except by financially strong organizations favorably situated with respect to their relations with large distributing interests, it might be assumed the rank and file of manufacturers would strive to so operate as to have no cumbersome stock accumulations. But this invariably makes for a scarcity of certain items for desirable deliveries, and this in turn supplies an inspiration for "going ahead" and taking the long chance.

Large department stores for some time have been buying even more conservatively than the better class jobbers, and will be likely to continue this practice. There will therefore be very keen competition for the business of catalog houses and chain stores, the volume for both of which is gaining month by month.

During the pre-holiday activity in retail stores it was notorious that department stores were using even some of the smaller jobbers as a convenience in the piecing out of their stocks day by day. The charge is made that such establishments have no more hesitancy in cancelling an order or rejecting merchandise than the small distributor operating in the cheap communities of every large commercial center.

So light were many of the department store orders placed with manufacturers of hosiery, underwear and sweaters, and so persistent were the buyers in hammering prices, that the representative of a large manufacturing establishment, expressing a sentiment not infrequently heard, was led to say: "Department stores have no license to buy from mills; they should not pester manufacturers; they ought to do their filling in exclusively through jobbers."

Hosiery.

Silk hosiery is especially a big item in the pre-holiday shopping. It was sold in enormous volume last month. Stores representatives said they had no difficulty in locating plenty of desirable full-fashioned silk for women, notwithstanding mills were reported to have sold their output ahead for at least three months. It was noteworthy, however, that the average special sale at especially low prices comprised in the assortment practically no perfect goods. It was an opportunity for making a cleanup of seconds and irregulars.

Necessarily a drive was made on some one item as a leader, and eight strand full-fashioned silk was extensively used for this purpose. Such establishments as the John Wanamaker store maintained a price of $1.25 a pair for perfects, while a Philadelphia chain of stores went below these figures by ten cents. The goods cost large buyers around $10 a dozen. A nine strand was available at the same price, although a New York commission house let some go at $9.75.

New price lists of manufacturers, higher by 50 to 75 cents a dozen for women's silk hosiery of nine to 12 strand, went into effect January 1, and it is understood most of the contracting for the first half of this year was done on that basis.

Prices are looked upon as absolutely safe, assuming the markets do not become glutted. One of the better known New York hosiery operators, representing several large southern manufacturers of silk, cotton and rayon hosiery, said: "I cannot see how manufacturers of full-

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fashioned silk hosiery could possibly sell at lower prices than were named for this year. More and more women will wear full-fashioned silk, and it looks to me as if the present stage of production might be safely maintained for some time. Not unless there be overproduction will prices be lower."

This about expresses the common opinion as to prices, which are viewed by some of the very conservative jobbing house buyers as fair. And these buyers foresee an increasing demand for full fashioned. "Why is it," the buyer for a well known Philadelphia jobbing establishment was asked, "that Philadelphia is an admittedly hard market in which to sell seamless silk and rayon hosiery, as contended by visiting salesmen?"

He mentioned two reasons. One was that the local jobbers are able to buy, generally, from local mills for short periods. The other, "the retail trade wants full fashioned almost exclusively." As Philadelphia is the full fashioned center of the world and Reading is only a few miles distant, it would seem manufacturers located elsewhere would have small chance of selling volume business in the Quaker City, in other than nationally advertised branded lines, usually sold direct by mill to retailer. This would appear to apply to not only full fashioned, but seamless silk hosiery as well, for considerable spring needle silk hosiery is made in Philadelphia.

As a general proposition, transactions in spring needle goods have not been on a large scale. Yet leading mills in Philadelphia and Reading are operating at capacity and selling their production. The Colonial Knitting Mills, in the former city, is understood to be especially well provided with orders, mostly from very large concerns in the catalog house and chain store class. The Starr Knitting Mills, Inc., in the same city, and the Golden Seal, in Reading, also are operating at a stage indicating they have orders a-plenty.

Prices of spring needle hosiery have undergone little or no change, notwithstanding mills are using silk bought at the higher figures. The spring needle seems to be the leader at retail prices of $1 to $1.25 a pair in establishments having the price benefit of quantity purchases. They are hardly available to the small retail shop to pass over the counter at those prices, and dependence is placed by them, generally, on latch needle construction for dollar a pair selling.

But good latch needle silk stockings also have moved beyond the dollar classification. A leading manufacturer says that 240- and 260-needle silks cannot be produced, except they be skimped, to go over the counter at less than $1.25 minimum. He has discontinued the making of seamless silks of any type of construction, but is having volume business with silk plaited on rayon.

This mill for some time has been selling to retailers, under an unconditional guarantee, replacing every pair returned, for any cause, with a new pair. The returns, it is stated, aggregate about one-fifth of one per cent of shipments. Every returned pair is subjected to a rigid examination in the laboratory of the mill, where they are carefully studied for ascertaining their weak points and how to strengthen. The outstanding weakness, it is related, is in the fabric directly over the toe and at the knee, where runners develop. Returns of the improved stocking will be again studied and comparisons made with those which previously had been received. If there shall be a decline in the number of complaints the management will feel that it

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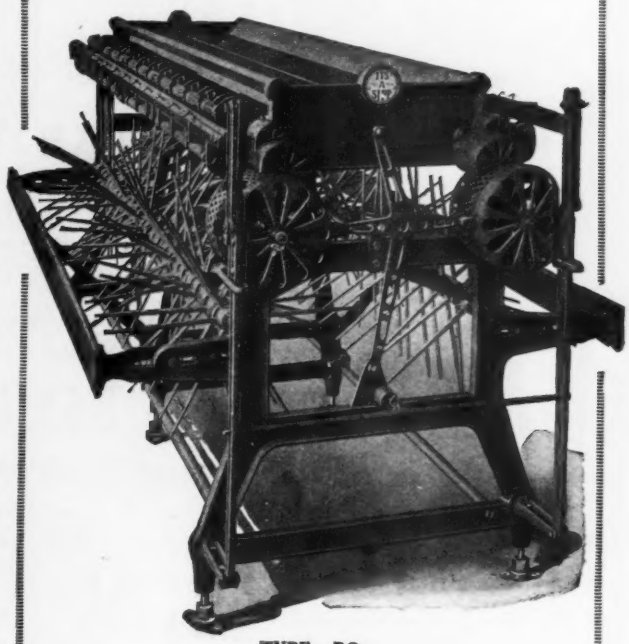

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has been amply rewarded for selling its product under a guarantee, a practice which ordinarily is attended with considerable risk, so far as relates to woman's purchases.

Women, it is complained by various interests, are more prone to abuse a return privilege than are men, and persons who have had experience with selling to both sexes by mail on the approval plan have said their relations with 75 per cent of the women were unsatisfactory, while being satisfactory with 85 per cent of the men. A woman, operating a small mail order business, said, "there is more honor among men than women, if my experience in supplying both with silk hosiery means anything."

Aside from full-fashioned silk, the type of stocking supplying the better guess as a mass production proposition is the silk plaited on rayon, a profitable dollar stocking in small retail establishments and a 69 cent possibility in chain stores. But even this type of construction showed a falling off in new business last month, attributable, mainly, to the disposition of jobbers to do little contracting for 1926 until after the customary January quiet period.

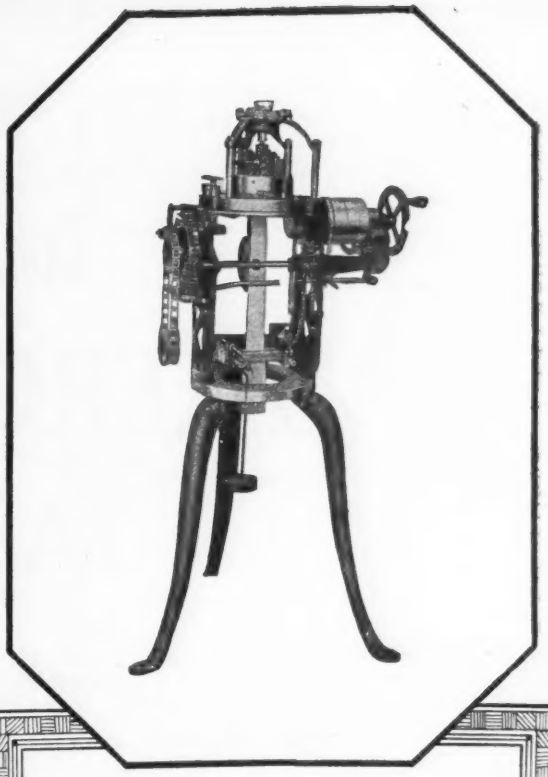
Silk plaited on rayon is promising of becoming a considerable part of the production of some of the full-fashioned mills, and a full fashioned of silk in combination at a dollar a pair is by no means a remote possibility, injecting a new problem for manufacturers of the circular knit.

Statistics compiled by the Department of Commerce from the reports of a large part of the hosiery industry are interesting as showing the trend in women's silk hosiery. Making comparisons with the ten months of 1924 to the end of October, gains shown for 1925 include 50 per cent for full fashioned, 18 per cent for seamless and 73 per cent for silk in mixture. Women's rayon boot hosiery gained but 12 per cent, comparing with 57 per cent for the nine months to the end of September.

Sales of women's wool hosiery have, thus far, been disappointing. Silks were the outstanding item for gift purposes and, except in certain sections, there was an absence of snappy weather such as is needed to boost sales of wool stockings. There was demand on mills for a time, but jobbers and retailers have not been able to move stocks out accordingly, and there is seen the possibility of a considerable carryover.

Mercerized hosiery for women, once a staple among staples, seems now to be a far more speculative proposition than the extreme among novelties. The plain mercerized is, at the moment, a perhaps safer asset than the R I and pineapple stitch, two forms of construction which had a lively but comparatively short existence. The R I still is good as a semi-sports stocking, but has lost its hold for street wear and has had to give way to pattern hosiery adapted to outdoor life and swagger makeup. There is some call for high grade full fashioned mercerized. "You would be surprised to know the quantities we are selling," said the executive of a mill making full-fashioned all-silk boots and all-mercerized. Production of women's cotton hosiery, including mercerized, increased very slightly this year over 1924, all of the gain undoubtedly being attributable to the use of novelty stockings in the lower price ranges.

With the stage set for another season for men's novelty hose, manufacturers are sampling with new patterns, while completing, in many instances, large orders placed a few months ago for spring deliveries. Manufacturers aiming at mass production are exploiting half-dollar-a-pair sellers



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and improving their designs. It has not been easy to supply a half-dollar sock with knitted in vertical and horizontal stripes, but it promises to be on the market shortly in a rather big way. A leading mill making novelty half hose exclusively is operating along the lines indicated, and the executive says their coming numbers of fancies will have knitted-in stripes "up and down and around the leg."

Half hose from this mill, and doubtless from others, costing retailers $4 to $4.25 a dozen is intended to go over the counter at 50 cents, but numbers of dealers are getting from 69 to 75 cents—depending on the elasticity of the seller's conscience or the absence of that attribute. So, it is reasoned by the manufacturer, it is the pattern rather than fabric that wins the consuming public. "Some of the retailer prices we hear of are criminal," he said, "but we no longer bother with them, so long as they sell our goods and pay their invoices."

While most of the spring and summer patterns for half hose have been shown in the primary market, new designs are on the way, and the list never will be complete so long as the public wears freak stockings and the field of patterns is circumscribed by no limitations. Manufacturers just now are trying to improve on their designs for wool hose, in preparation for the 1926-7 season.

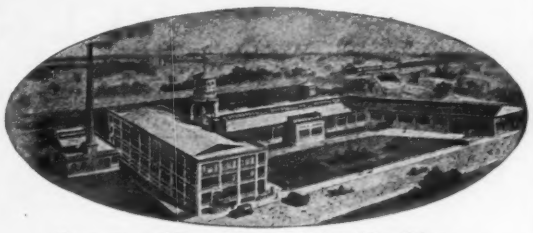
Two of the smaller but well known Pennsylvania mills expect to put on the market "silk-and-wool" half hose that will show a substantial retailer profit when sold at a half dollar a pair. They have been experimenting with a yarn mixture of 20 to 30 per cent wool and the remainder cotton, to be used in combination with a very light sprinkling of rayon, for obtaining desired effects in dyeing.

Preparation for the next winter season may be on a more ambitious scale than usual, as many manufacturers and distributors underestimated their needs for the current season and supplies of moderate price goods of certain types were exhausted even before the beginning of the calendar winter. Manufacturers late in the year found a ready market and declined numbers of small orders. There had been cancellations and returns, and they refused to continue to put goods in process. So before there had been a taste of wool sock weather, wool socks were scarce, giving retailers an opportunity to mark up prices for distinctive numbers.

A considerable falling off in production of men's rayon hose is indicated in reports of manufacturers, and, according to some of the leading distributors, this was justified by lessened demand from retailers. For the 10 months to the end of October the indicated increase in output, comparing with the corresponding period of 1924, was but one per cent, while for the preceding nine months the gain was around 13 per cent. This decline was, of course, altogether seasonal, but it is doubted that rayon for either men's or women's hose will be as popular this year as last, except in combination with silk or mercerized yarn.

Men's socks promise to run to fancies and women's to silk, mostly in plain colors, with little likelihood of any very extensive use of the knee length stocking. This statement may be questioned by some manufacturers, but hardly by retailers, and it is supported by the advance business that has been placed.

The coming season for juvenile hosiery will show little that has not already appeared in the primary markets. A few observant factors say they detect a slight reaction from extreme patterns for misses, but there is no indication of a



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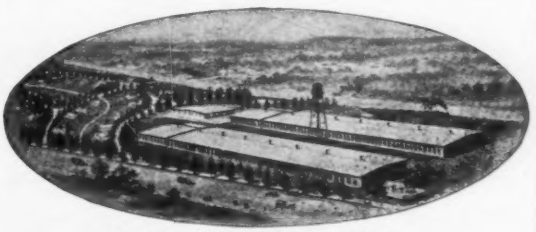

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return to the plain. Three-eighth lengths may, to some extent, displace the seven-eighth, later in the season.

A popular type of juvenile hosiery is made with the jacquard leg and top of a near approach to jacquard construction, but knitted on foreign-built machines. A mill making this style is operating overtime and has not reduced prices from last year's opening level, notwithstanding there were reductions of 25 cents a dozen, to $2.75, by manufacturers of English ribs with the Brinton top. While there was no real price competition, the shading had the effect of mildly disturbing jobbers who were about ready to place repeat orders.

Most of the manufacturers of children's lines and infants' socks are comfortably situated as to business for future months. There are some, however, who are open for orders for both nearby and distant deliveries. One sock manufacturer, who had oversold of a popular price line, was in the market a few weeks ago for 10,000 dozen pairs, and found none of the Philadelphia mills in position to help him out of his dilemma. One was in arrears with his production schedule and was operating overtime to catch up.

Underwear.

Cotton ribbed underwear for the season of 1926-7 was opened a few weeks too early, in the opinion of leading eastern jobbers. Some had gone on record a month before in opposition to the naming of prices until about the first of January, and they profess to see vindication for themselves in the happenings following the opening, which had its beginning about the first of December, when several of the southern mills came on the market with substantial reductions from the previous year's lists, in conformity to the lower cost of cotton yarns.

As cotton declined quite decidedly, on the final government crop report, which came out subsequent to the offering of the lines of several of the southern mills, there were predictions the opening prices would have to be revised, and some excitement was looked for with the offerings by northern manufacturers who deferred their opening to the third week in December. The expected fireworks did not materialize. By that time there were trustworthy reports that the Tennessee mills—the Appalachian Mills Co. and the Standard Knitting Mills—had booked about the average volume of early business, for January to March deliveries, and that one or two numbers had for the time been withdrawn from sale. This served to stiffen the situation for the timid, who received additional encouragement from the fact The Atlas Underwear Co. and The Piqua Hosiery Co., both in Piqua, Ohio, two recognized conservative establishments which usually are not influenced by what the southern and eastern manufacturers do in the way of opening, also were out openly for business. By the middle of the month practically all of the New York manufacturers had gotten into the procession and, except as to certain distinctive mill lines, there developed promise of lively competition.

The P. H. Hanes Knitting Co., Winston-Salem, N. C., was about the last of the southern mills to name prices, which came out lower than a year before by about the average reduction of competitors. It was understood the reason why the Hanes deferred the opening until near the middle of December was that it had a number of orders against which shipments had not been completed. The mill was known to have been sold well up and pressed for deliveries. It is unofficially stated the 1925 business of the

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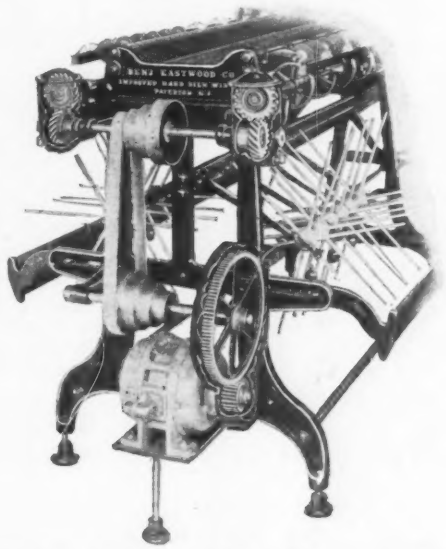

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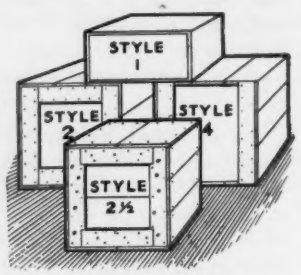

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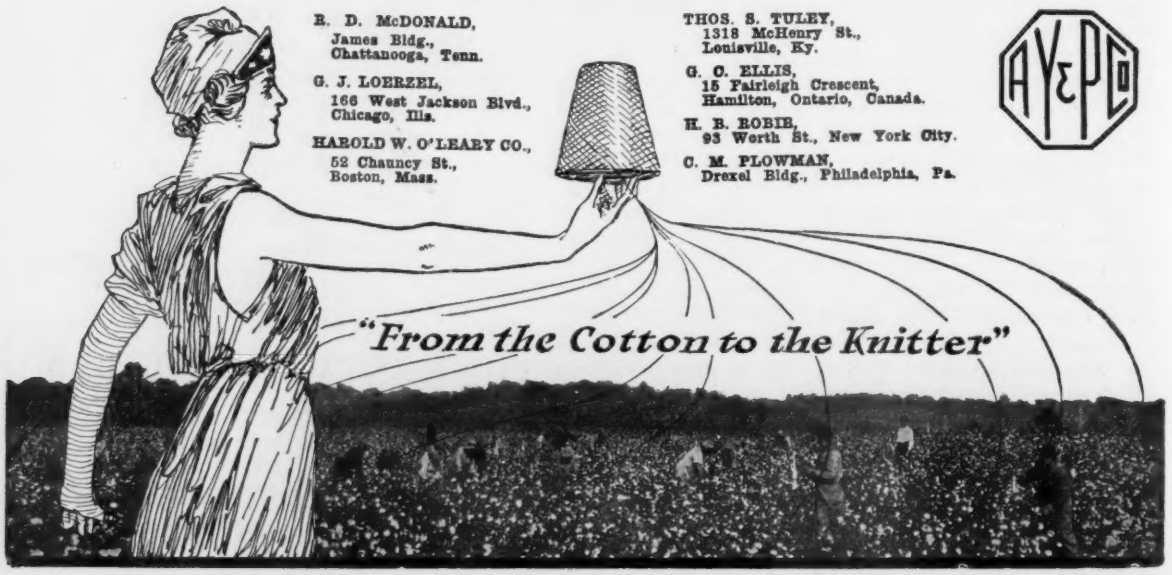

P. H. Hanes Knitting Co. was the largest for any one year in its history. Added to its lines for this year is an eight-pound shirt and drawer, designed to sell in retail stores at 75 cents per garment.

That some active bidding for early business would be witnessed was foreshadowed, it was believed, when the Blood Knitting Co., Amsterdam, N. Y., got under the prices of two southern mills by 25 cents a dozen. As if to offset the effect of this, the High Rock Knitting Co., Philmont, N. Y., about that time announced increases in cotton fleeced underwear over the 1924-5 prices, notwithstanding yarns were down and demand for fleeced underwear was regarded as declining from year to year.

Leaving out of consideration the business placed with the several southern mills which had led in the opening—business for the early months—jobber contracting is believed to have been on a very conservative basis. Distributors claimed to be not certain that cotton had touched bottom and that manufacturers would not find it expedient to make revisions in favor of buyers. Some of the large buyers said, in effect, they would "buy when they got ready," and that initial offers would be light. It is recalled that important jobbing houses usually talk in that strain about the time manufacturers come on the market for a new season.

Leading underwear factors say they believe the 1926 business will exceed that of 1925. There have been certain refinements in construction and, it is pointed out, better underwear at lower prices will be available to retailers. All will enter upon the next season with fresh goods, there being, practically, no carryover. In fact, jobbers continued last month to buy goods for stock, conservatively, of course, for deliveries in January, in order to be prepared for a retailer demand this month.

Most of the dealers, it is held, will need more winter underwear, judging from their very small orders for at-once delivery last month. They were buying in lots of a quarter dozen to perhaps two dozen garments, and repeating, at times as often as twice to three times within a week. Jobbers declared they were "doing a real nice retail business, at the jobber per cent of profit," and this appeared to be true of most of the Philadelphia wholesale establishments.

Wool underwear for the next heavy weight season has had a good start in the matter of contracting by jobbers. That wool and cotton fleeced underwear is interesting thus early to jobbers may be said to be due to the fact few mills are making these lines, and that last year there developed a perplexing situation for distributors who had underestimated their requirements.

Trading in knitted light underwear has not been active for some time. Although jobbers' initial orders were not unusually heavy, they appear to have covered for a large part of the early 1926 months. They have not, they say, received much encouragement from the retail trade and therefore may be slow to repeat, and the broad intimation was given last month that in view of the slipping in cotton, duplicate business would have to be accepted at less than the opening prices. Retailers, it was held, will look for a readjustment of prices to the lower level for cotton yarns, so that whatever advantage jobbers may derive, from having deferred, they will have to pass to the retail merchants.

Retailers are reported having bought quite liberally of nainsook and kindred lines, and this is being used against

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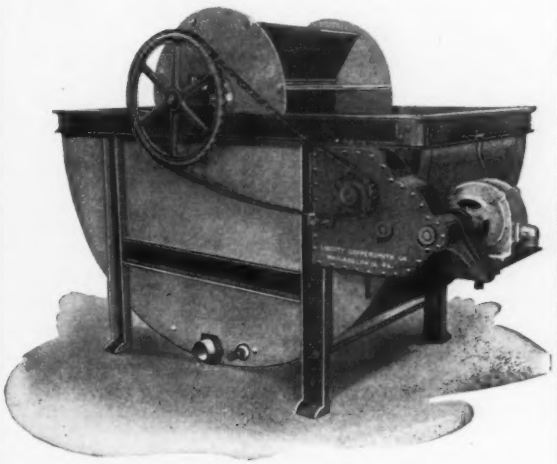
Skein Tanks, Pails, Dippers, Etc.



MONEL METAL PADDLE MACHINE
MOTOR DRIVE

Liberty Coppersmithing Company
1708-16 N. HOWARD ST., PHILADELPHIA, PA.
Repair Work a Specialty.

VISCOSE
RAYON YARNS
Regular Yarns from 150 up to 1800 denier
Regular and Special Twists for Weavers, Knitters and Braiders
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the manufacturers of the knitted. Light weight knitted underwear was, therefore, a somewhat uncertain commodity, so far as relates to value, at the beginning of the year. As there was little active jobber interest there was no attempt to coax business by shading quotations, and it is possible manufacturers will be able to finish their season with less than the disturbance that at times was regarded imminent.

Sweaters.

Although sweater lines were opened in Chicago on November 9, little business had been placed to the end of the year, according to all reports. Mills named prices before jobbers were ready to buy, and as business was coming only slowly there were speedy readjustments, which had the effect of prolonging the agony for mills. Furthermore, there was and still exists much uncertainty as to style.

It is believed the knitted windbreaker, which was hurt last year by the popularity of the woven coat with the knitted windjammer band, will be a better guess this year. Whether the jacquard coat will hold the prestige won for it last year is another question in the minds of manufacturers. Cricket coats and sports garments are regarded likely propositions, but here again the question of construction bobs up.

Sweaters for women are coming to be looked upon as something that was and no longer is. Last year bal briggan two-piece suits superseded sweaters, as they are commonly known, and next summer, with the bal briggan no longer in the running, there are to be two-piece suits of a different fabric. The woman with such a suit, it is pointed out, will have a coat to be worn with a skirt that is not a part of the suit. The more suits she buys the more coats she will have, and the fewer sweaters will she put in her wardrobe.

Analyzing the sweater situation at the beginning of the year, it looks as though initial orders will be light and be placed late. Of course, some business has been booked by leading mills, but no manufacturer claims to have on his books the volume of business that ordinarily has been taken within a month to eight weeks after the opening.

The fact that wool last month gave evidence of further weakening and that spinners were begging for business in worsted yarns was made use of by sweater and bathing suit manufacturers for deferring yarn commitments, and with yarn prices then in the balance there seemed little incentive for mills to push for volume business at the then current quotations.

Among the Knitting Mills.

The largest hosiery knitting machine in operation in the United States, it is claimed, was given a tryout last month in the new full-fashioned mill of the Endurance Hosiery Mill, when the company's 28 section footer was started running. A few other mills are installing similar machines, but had not gotten them in operation at that time. The Endurance is also installing 24 section leggers. Their leggers and footers comprise about four sections more than most of the machines in use, and they are constructed for a speed of 70 courses per minute, comparing with 50 to 55 as an average. Use of machines of such capacity obviously means a greater increase in production than ordinarily is indicated by the number of machines being set up.

The Endurance is installing Theodore Lieberknecht machines, the same type as will go into the new mill being erected in Blackwood, N. J., by interests headed by Louis Weber, Sr., the Cambria Silk Hosiery Co., of Philadelphia. Both will have their complete plants in operation by the beginning of summer. Practically all of the new installation is of 42-gauge machines.

Schubert & Salzer machines of this gauge are being set up by the Harron Hosiery Mills, a new Philadelphia corporation, which will be in operation early this year.

The Co-Ed Knitting Mills, building an addition to the factory in Philadelphia, will install 20 full-fashioned machines from the Textile Machine Works, in Reading, Pa., about equally divided as between 39 and 42 gauge. Until the new factory gets into operation, along toward summer, it is stated, the present plant will be operated with two shifts, the concern being sold ahead up to June.

The complete full-fashioned plant of the Oscar Nebel Co., to be in operation in Hatboro, near Philadelphia, in the course of a month or two, will comprise 44 machines of 42 gauge, from the Textile Machine Works.

Interests headed by H. W. Anthony, manufacturer of half hose, at Strausstown, Pa., are erecting a building at Sinking Spring, near Reading, which will house a full-fashioned hosiery plant, to be in operation by the middle of the year. It is understood that about $500,000 will be invested in building and equipment.

With the completion of deliveries of full-fashioned machines contracted for by the Rosedale Knitting Co., Reading, Pa., a battery of 300 machines will be in operation. Probably all of the machines will have been set up by the end of summer. The company is understood to have several large contracts.

Work is progressing rapidly on the new building of the Reading Maid Hosiery Mill, Reading, Pa., which will start operations in a few weeks, and probably will have the entire complement of 54 machines going by Fall.

Setz-Right Hosiery Mills, Hickory, N. C., have been incorporated with a capital of $25,000. Half-hose is being manufactured, with an equipment of 50 machines. J. D. Elliott, prominent Hickory manufacturer, is president. P. A. Setzer is treasurer, and P. A. Mullins is superintendent.

Harron Hosiery Mills, Philadelphia, have been incorporated and will manufacture full-fashioned hosiery. The capital is $180,000. Joseph A. Harron is one of the principal stockholders.

C. H. Summers, W. T. Busby, and others, have incorporated the Nancy Hosiery Mills, Salisbury, N. C. The capital is $25,000.

Standard Knitting Mills, Knoxville, Tenn., have increased their capital stock from $80,000 to $1,100,000.

Alden Mills, Meridian, Miss., will erect a new 50 x 120 addition, contract for which has been awarded.

A new mill, 80 x 350 feet, will be constructed by the Newnan Hosiery Mills, Newnan, Ga. Robert & Company are the architects and engineers. The new construction work also will include a dyehouse and boiler plant.

Washington Hosiery Mills, Nashville, Tenn., will erect an addition to house a dyehouse and boarding room. The addition will be 87 x 87 feet, of brick construction with steel sash. The cost will be approximately $20,000.

It is understood that the Davis-Allcott Hosiery Mill, Gadsden, Ala., will erect a $20,000 plant, to be 60 x 180 feet, one-story, of brick construction.